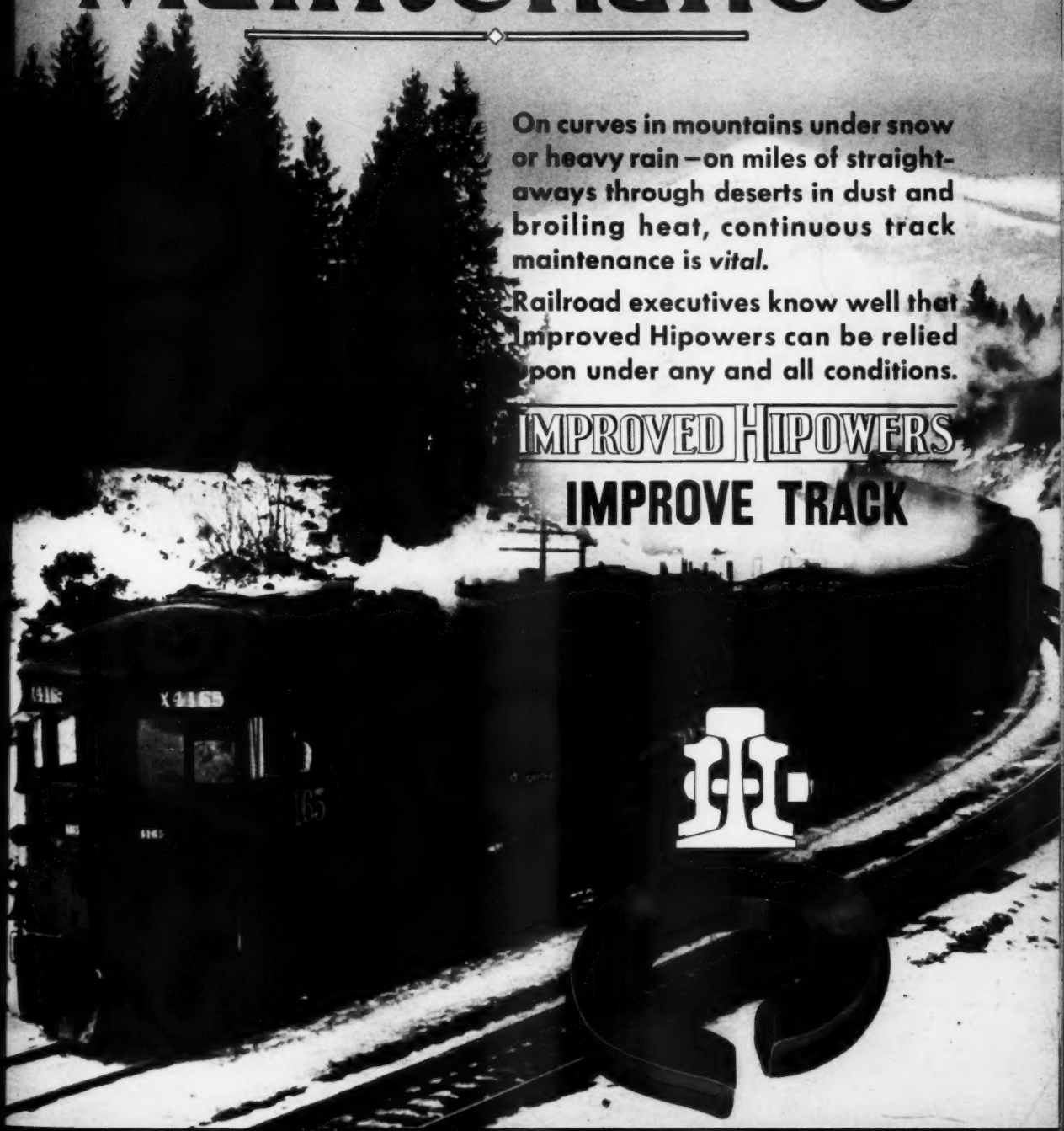
FEBRUARY, 1948

# Railway Engineering and Maintenance


On curves in mountains under snow or heavy rain—on miles of straight-aways through deserts in dust and broiling heat, continuous track maintenance is *vital.*
Railroad executives know well that improved Hipowers can be relied upon under any and all conditions.
IMPROVED HIPOWERS
IMPROVE TRACK

# VISION IN THE USE OF RAILWAY TRACK FASTENINGS

## INCLUDES RELIANCE HY-PRESSURE HY-CROME *Spring Washers*

Our eyes tell us the tracks meet at the horizon. Engineering knowledge tells us otherwise. Engineering vision goes beyond appearance to provide efficiency, economy, safety.

Engineering vision is an important factor in Spring Washers, too. Combined with experience, manufacturing ingenuity and careful control of raw material, it puts quality and satisfaction into them. They accomplish the very definite purpose of better maintaining track joints. They keep track bolts *tighter longer* and under constant tension. They also act as hardened thrust bearings, permitting a better tightening job.

The use of vision in the selection of track washers definitely points to Reliance Hy-Pressure Hy-Crome Spring Washers. There is a spring washer in the Hy-Crome family to successfully cope with every track fastening problem. May we suggest that you call upon the Eaton Reliance railroad representative to help you with your engineering and purchasing problems.

*Edgemark of Quality*

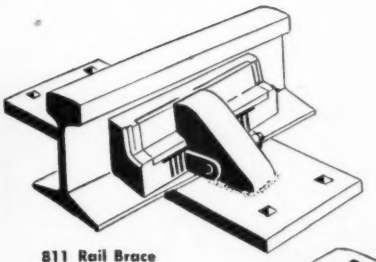
***Visit the Reliance Exhibit at Booths 75-76***
***National Railway Appliance Assn. Show***
***A. R. E. A. Convention***
***International Amphitheatre, Chicago***
***March 15-18***

*Reliance* **HY-PRESSURE HY-CROME** *spring washers*

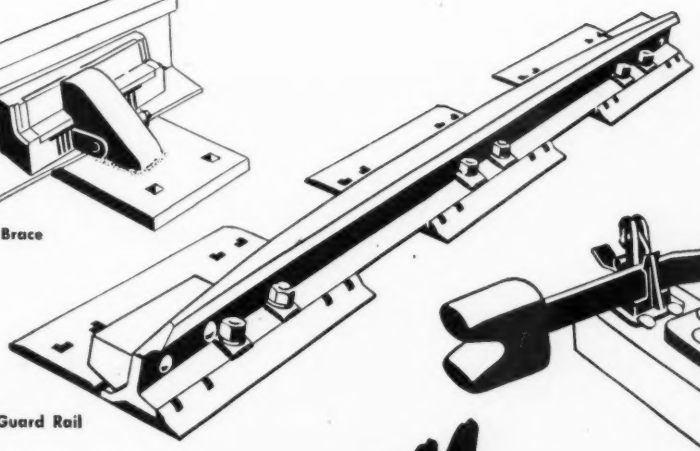
**EATON**
**EATON MANUFACTURING COMPANY**

**RELIANCE DIVISION**
**Offices and plant: MASSILLON, OHIO**

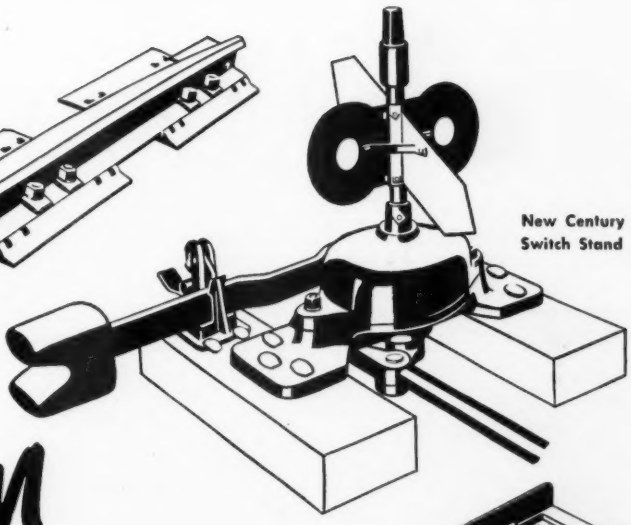
**Sales Offices: New York • Cleveland • Detroit • Chicago • St Louis • San Francisco • Montreal**



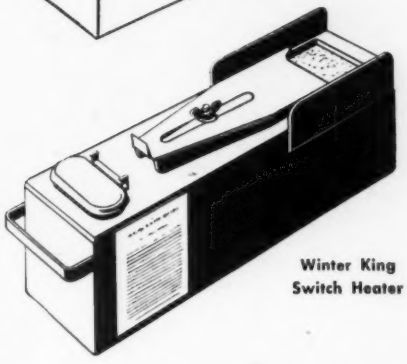
811 Rail Brace



Hook-Flange Guard Rail



New Century Switch Stand



Winter King Switch Heater

# BETHLEHEM ... a great name in Track Products

Solid Manganese Frog

Twin Hook Frog Plates

From heavy rails to bolts and nuts, Bethlehem makes virtually every item of track equipment—frogs, switch braces, switch stands, and all the rest.

That these specialties are so widely used, by so many of the nation's top railroads, speaks eloquently of their quality. Had they not been quality products through the years, they could never have stayed a jump ahead of the field in design, durability, and performance.

Whether you need standard equipment or are planning special trackwork, Bethlehem can furnish it. As always, we are prepared to do a traditionally good job for you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation*

*See Bethlehem for Track Products like these:*

**BOLTS AND NUTS • CROSSINGS • FROG PLATES • FROGS**
**GAGE RODS • GUARD RAILS • JOINT BARS • RAIL BRACES • RAILS**
**SPIKES • SWITCHES • SWITCH HEATERS • SWITCH STANDS • TIE PLATES**

BETHLEHEM STEEL

Published monthly by Simmons-Boardman Publishing Corporation, 105 W. Adams St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, $2.00 for one year; $3.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Mount Morris, Ill., post office. Address communications to 105 W. Adams St., Chicago 3, Ill.

# LOW, LOWER, LOWEST

## ROADBED MAINTENANCE COSTS

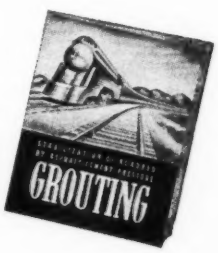
### Add Texaco No. 24 Emulsified Asphalt to grouting mixtures for longer-lasting stability

Roadbed maintenance costs are lowest when track is stabilized by pressure grouting — with *Texaco No. 24 Emulsified Asphalt* as the key ingredient of the mixture. *Texaco No. 24 Emulsified Asphalt* was developed especially for grouting and only a little — frequently no more than 1/10 gallon per cubic foot of sand is needed.

*Texaco No. 24 Emulsified Asphalt* improves the ordinary cement-and-sand grout by promoting easier flow, more thorough penetration, and better seal. The soil is waterproofed and stabilized without loss of resiliency. Thus, greater permanence is achieved . . . the work is done quicker . . . first cost is low . . . and savings in maintenance costs are truly impressive.

For figures on savings *actually realized*, read the book shown at lower right. Just call the nearest Railway Sales Division office listed below, or write The Texas Company, *Railway Sales Division*, 135 E. 42nd St., New York 17, N.Y.

SEND FOR this fact-packed, 16-page, illustrated book. Describes the development of asphalt-cement pressure grouting, outlines a practical working set-up, shows costs, and benefits secured by a leading railroad.



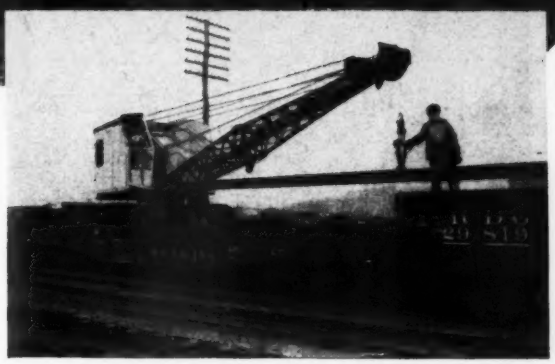

NEW YORK • CHICAGO • SAN FRANCISCO • ST. PAUL • ST. LOUIS • ATLANTA

TEXACO

# TEXACO Emulsified Asphalt FOR GROUTING

TUNE IN . . . TEXACO STAR THEATRE presents the TONY MARTIN SHOW every Wednesday night. • METROPOLITAN OPERA broadcasts every Saturday afternoon.

# Making relocation problems cost less...



Widening right-of-way, curve reduction, relocation, siding and shortline construction — these are some of the problems of the day — a part of high-speed traffic. You need equipment that is fast, versatile; mobile equipment that will cut the cost of construction. These are problems that Northwest Crawler equipment is solving for many other railways.

Your Northwest goes anywhere! It loads under its own power on a standard flatcar, works from the car and travels from car to car. When required for off-the-line work it is a simple matter to unload at the job to care for drainage problems, bank trimming, fill construction, shoulder widening, handling rail or doing any of the many other new construction and maintenance jobs that every railroad faces.

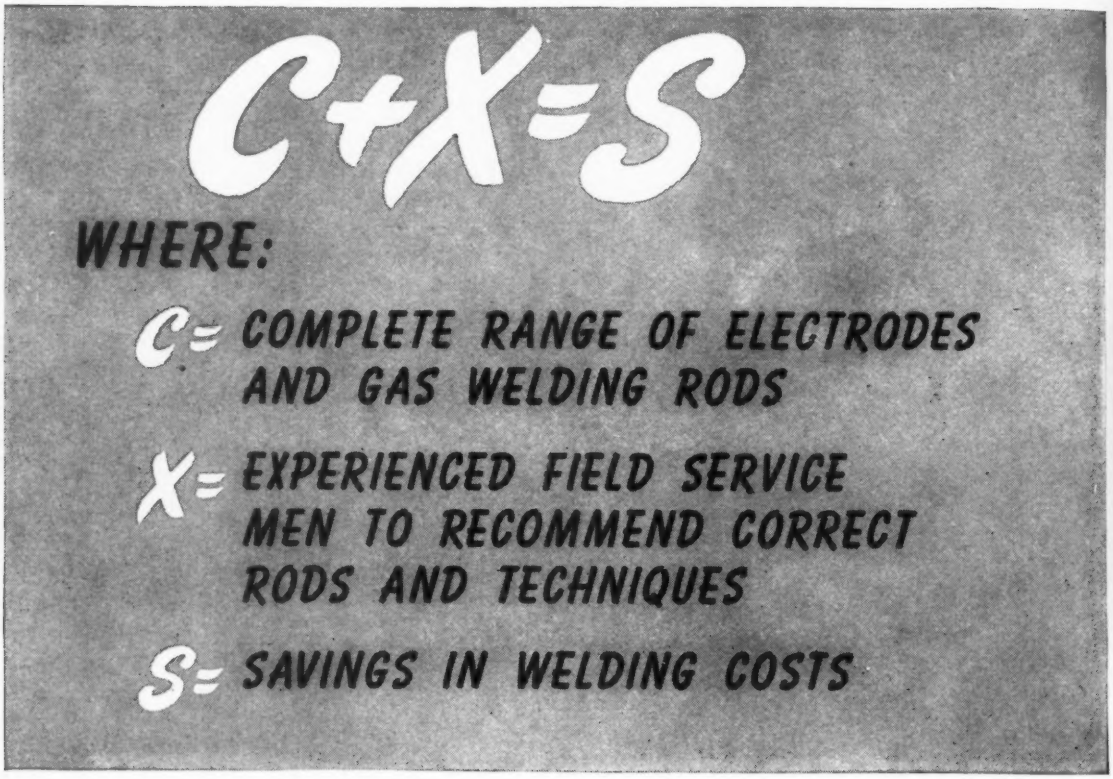
All Northwests are convertible from a Crane to a Dragline or Shovel by simply changing booms, assuring you full machine versatility. Remember, a Northwest does things you can't do with a track type crane. Let us give you complete details.

**NORTHWEST ENGINEERING COMPANY**
**1513 Field Bldg., 135 South LaSalle St., Chicago 3, Illinois**

# NORTHWEST

**THE ALL PURPOSE RAILROAD MACHINE**
**SHOVEL • CRANE • DRAGLINE • PULLSHOVEL**

# PAGE *Welding* ELECTRODES


C+X=S
WHERE:
C= COMPLETE RANGE OF ELECTRODES AND GAS WELDING RODS
X= EXPERIENCED FIELD SERVICE MEN TO RECOMMEND CORRECT RODS AND TECHNIQUES
S= SAVINGS IN WELDING COSTS

This is the PAGE formula for economy in production welding. The uniformly high quality of PAGE welding electrodes and rods is not included, because that is simply taken for granted by experienced welders.

Through PAGE Field Service Men, your PAGE distributor can give you valuable up-to-date information on welding techniques and selection of electrodes. That's why we say . . .

## *Get in Touch with Your PAGE Distributor*

ACCO

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

TRADE MARK

**PAGE STEEL AND WIRE DIVISION**
**AMERICAN CHAIN & CABLE**

## For UNDERLAYMENT...

## For UTILITY FLOORS...

# *More for your money with Asphalt Mastic!*

Here's an *all-round* flooring material. Cold-laid Asphalt Mastic made with Flintkote Flooring Emulsions, for heavy duty floors and for underlayment.

*Mastic* underlayment adds resilience to any floor. It provides an ideal base for the finish floor. And it's particularly good for reflooring jobs, because it can be used over almost any clean, firm base.

In waiting rooms and office spaces, make sure of a better floor by using a *mastic* made with Flintkote Flooring Emulsions.

* * *

For shops, station platforms and the like, install heavy duty mastic floors made with Flintkote Flooring Emulsions.

They're quick and easy to apply over almost any firm base. Use this type for resurfacing or new construction.

And Mastic Floors made with Flintkote Emulsions are self-healing of minor scars and rutting. Withstand heaviest traffic without damage. Dustless, resilient, shock-absorbing and sound-deadening, they help provide clean, comfortable, quiet working conditions.

* * *

Write today, and ask us to tell you how you can get more for your money with asphalt mastic.

THE FLINTKOTE COMPANY
*Industrial Products Division*
30 Rockefeller Plaza, New York 20, N. Y.
Gentlemen:
Please send me your new FREE booklet on Flintkote Flooring Products.

*Name* _____

*Company* _____

*Street* _____ *City* _____ *Zone* _____

*State* _____ *Position* _____

RCM-248

**FLINTKOTE**
*Products for Industry*

FLINTKOTE INDUSTRIAL PRODUCTS

ATLANTA • BOSTON • CHICAGO HEIGHTS • DETROIT • LOS ANGELES • NEW ORLEANS • WASHINGTON • TORONTO • MONTREAL

# SERVICE THAT COUNTS

## NEEDS GOOD TRACK MAINTENANCE

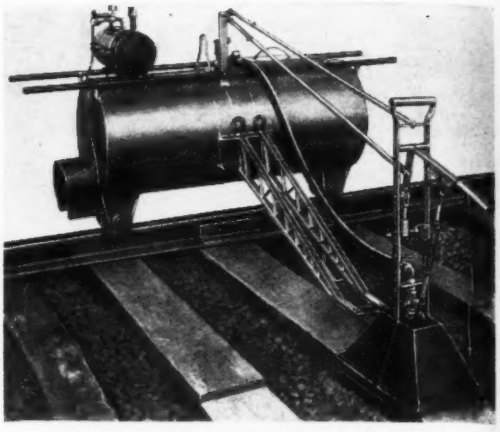
Customers of the Wabash are accustomed to getting Service That Counts. To deliver this service, the Wabash knows that good track maintenance is essential. That is why WOOLERY Weed Burners and WOOLERY Creosote Sprayers are a part of their roadway maintenance equipment.

**Because track maintenance is such an important factor in delivering good service, over 75 railroads use all types of WOOLERY Maintenance Equipment.**

# WOOLERY WEED BURNERS

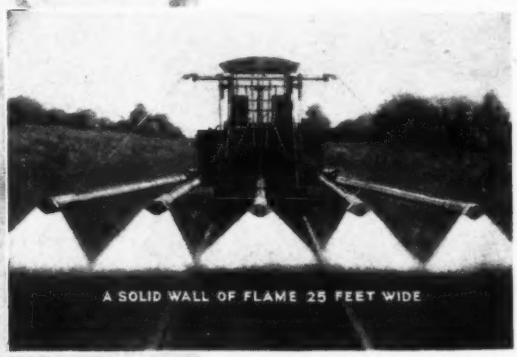
**...are available in 5-burner, 3-burner, 2-burner and 1-burner models**

**WRITE FOR complete information and performance data on Woolery Weed Burners and Creosote Sprayers.**



THE WOOLERY CREOSOTE SPRAYER

with 60 gallon tank capacity, needs only two men to operate. Equipped with generator burner to heat creosote, and wind protection hood to safeguard operators, it applies a metered amount of creosote to each freshly-adzed tie. The WOOLERY sprayer does a safer, less expensive, more uniform job than is possible by old-fashioned hand swabbing or broom-and-pail methods.



A SOLID WALL OF FLAME 25 FEET WIDE

### WOOLERY GIANT OCTOPUS WEED BURNER

The Giant Octopus—Five Burner Type—spreads a solid sheet of flame 25 feet wide—or to 35 feet wide with arms extended. The additional spread of weed destroying fire makes the WOOLERY GIANT OCTOPUS the most valuable machine for all roadbed work.

Cost records of Railroads using WOOLERY Weed Burners prove that they provide the cheapest method of destroying weeds.

# WOOLERY MACHINE COMPANY

MINNEAPOLIS — Pioneer Manufacturers of — MINNESOTA

## RAILWAY MAINTENANCE EQUIPMENT

RAILWAY WEED BURNERS • MOTOR CARS • TIE CUTTERS • TIE SCORING MACHINES • RAIL JOINT OILERS • CREOSOTE SPRAYERS • BOLT TIGHTENERS

EXCLUSIVE EXPORT REPRESENTATIVES: PRESSED STEEL CAR COMPANY, INC., PITTSBURGH, PENNA.

## ...Le Roi announces the Model 52 Paving Breaker

### ...its new, easy-holding action packs a wallop that saves you money

Here's a new paving breaker that you must try. Our tests, and they've been tough, indicate that this machine reduces the cost of breaking concrete. The 52 is truly a champion — these features guarantee it:

● **A knock-out punch that puts "high costs" down for the count.** Le Roi's 52 breaker has a happy combination of bore, stroke, valving, and timing that produces its highly effective concrete-shattering blow.

● **Easy to handle.** The 52 weighs 80½ pounds. Overall length is only 29 inches, and handle width 15 inches — operators can move it around with less effort. Rubber hand grips, a new valve action, and an air-cushioned front end minimize vibration. A latch-type retainer makes steel-changing easy.

● **A bear for punishment.** Sturdy drop forgings are used throughout. The throttle valve has a replaceable bronze bushing. The slug-type piston is reversible, a feature that adds many hours of operation to its life. A generous oil reservoir and a new type of lubrication system helps maintain peak operating efficiency — *the 52 is the first breaker to introduce positive shank oiling to increase chuck-bushing life.* A generous bearing giving full support for the full length of the tappet stroke, maintains alignment, and eliminates tappet spalling. A swivel hose connection increases the life of the hose.

● **A miser when it comes to using air.** You can run Le Roi's Model 52 off any standard 60-foot compressor. The 52's new end-seating valve meters the air sparingly without weakening the force of blow — and it actually improves with use, assuring efficient dependability.

The frost will be out of the ground before long — so see your Le Roi distributor about delivery of Model 52's for your spring work.

*Write us for literature.*

**SPECIFICATIONS**

| | |
|---|---|
| Weight, lbs. | 80½ |
| Length, inches | 29 |
| Width, inches | 15 |
| Standard Shank size, inches | 1¼ x 6* |

*1⅛" x 6" shank also available. Sheeting driver frontheads can be supplied for 2, 2½, and 3-inch piling. Spike driver frontheads are also obtainable.

**LE ROI COMPANY**

MILWAUKEE 14, WISCONSIN

NEW YORK • WASHINGTON • CLEVELAND • BIRMINGHAM
TULSA • BUTTE • SAN FRANCISCO

RD-15

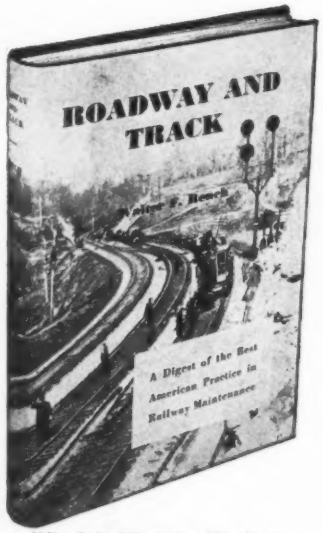
**Take a round out of pavement-breaking costs with LE ROI'S New 52**

*New Third Edition*

# ROADWAY AND TRACK

**By Walter F. Rench**

*Formerly Supervisor on the Pennsylvania Railroad;*
Author of *Simplified Curve and Switch Work*




1946. 3rd. 350 pages, 101 photographs, 19 line drawings, 12 tables, index, 6 x 9, cloth, $5.00

The new edition features the use of the latest mechanical equipment in connection with roadway and track maintenance. Older methods employed where full mechanical equipment is not available are also explained. While most of the methods described are those which are standard on the *Pennsylvania,* A.R.E.A. recommended practices and those in use on other well maintained roads have also been included.

Outstanding types of mechanical equipment used in track work are described and illustrated with action photographs. Engineering drawings show working details. The economies resulting from the adoption of modern methods are clearly outlined. Useful tables have been added to make the book suitable for reference use, as well as a practical handbook on modern methods.

## For Track Supervisors

While written primarily to serve the needs of track supervisors and other maintenance officers, the new edition contains material of considerable interest to transportation and mechanical officers who require a working knowledge of the fundamentals of maintenance of way practice. Section and extra-gang foremen, who wish to acquire a broader knowledge of their work and of methods used elsewhere, will find the book helpful.

## CONTENTS

Part I—ROADWAY: Essential Elements in Roadway Maintenance—The Right of Way—Drainage of Roadbed and Track—Vegetation for Banks—Economics of Roadway Machines—Labor Saving Methods and Devices in Roadway Work—Small Tools and Their Uses.

Part II—TRACK: Essential Elements in Maintenance of Track—Program for Maintenance of Way and Structures Work—The Track Obstruction—Power Machines and Equipment—Labor Saving Methods in Track Work—Track Materials and Their Uses—Practice in Rail Renewals—Practice in Rail Repair and Inspection—Maintenance of Main Tracks—Maintenance of Yards and Terminals.

Part III—SPECIAL PROBLEMS AND DUTIES: Maintenance Problems and Methods Used—Economics of Track Labor—Special Duties in the Maintenance of Way Department.

## Send For Your Copy Today

**To obtain one of the first copies send in your order today. Give it a ten day examination. If it is not the track book you have been looking for you can mail it back.**

*Ten Days Free Examination Coupon*

**Simmons-Boardman Publishing Corporation**
**30 Church Street, New York 7, N. Y.**

**Please send me on Ten Days Free Examination a copy of the Third Edition of ROADWAY AND TRACK by Walter F. Rench. If satisfactory, I will remit the list price of $5.00. Otherwise, I will mail the book back postpaid, without obligation.**

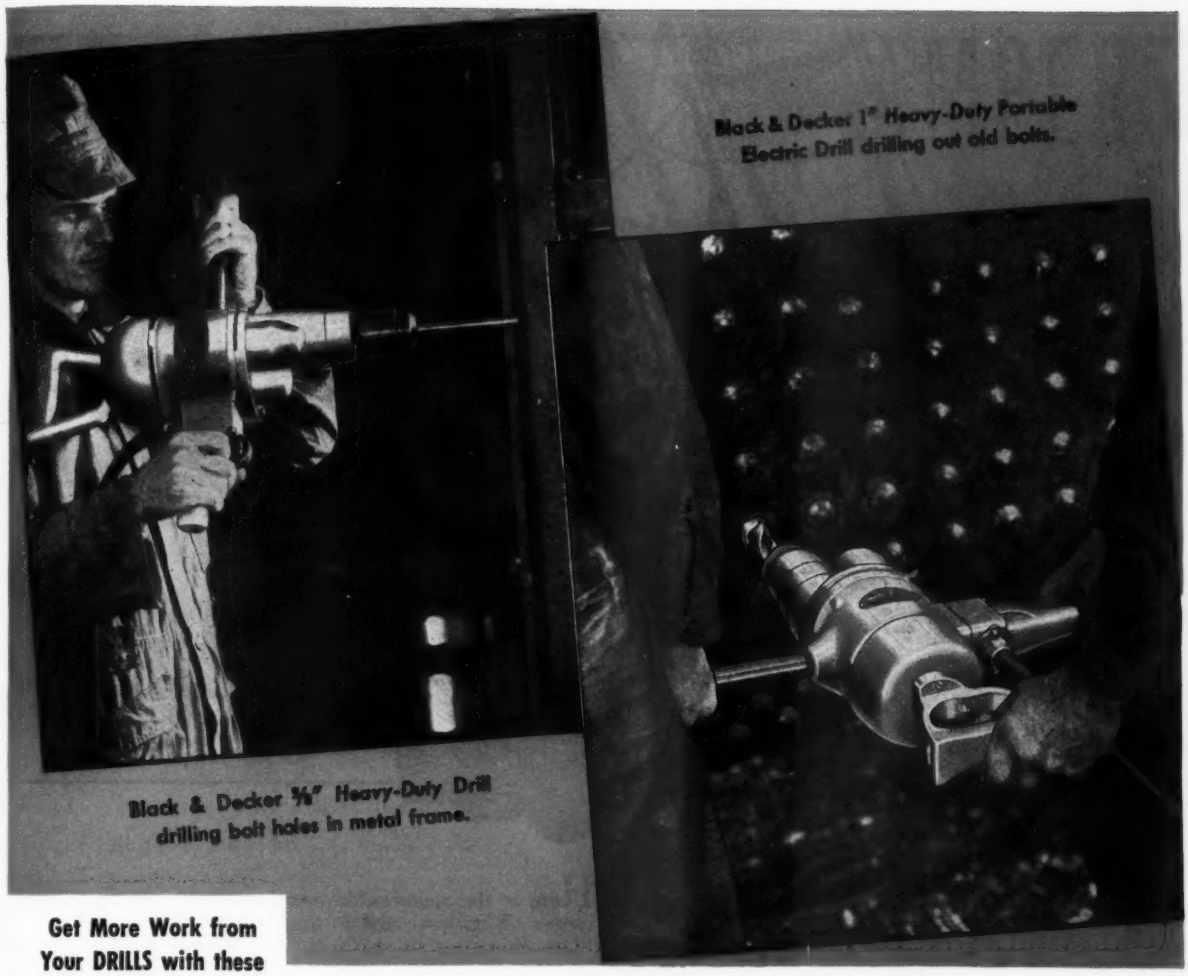
Name .....

Address .....

City ..... State .....

Company ..... Position .....

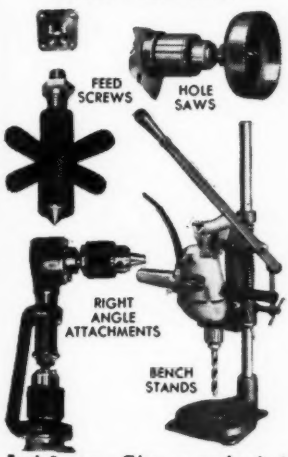
R. E. & M. 2-48



Black & Decker 1" Heavy-Duty Portable Electric Drill drilling out old bolts.

Black & Decker ⅝" Heavy-Duty Drill drilling bolt holes in metal frame.

**Get More Work from Your DRILLS with these Useful Accessories!**




**Feed Screws**—Give a mechanical "push" for constant, steady feed pressure, in close quarters.
**Hole Saws**—Cut clean, round holes in any material a hacksaw will cut; ⅝" to 4" diameters.
**Right Angle Attachments**—Help you drill and bore around corners, in close clearances.
**Bench Stands**—Quickly convert your portable drill to drill press use for accurate and heavy-duty work.

# These RUGGED DRILLS Speed Up Heavy-Duty Work

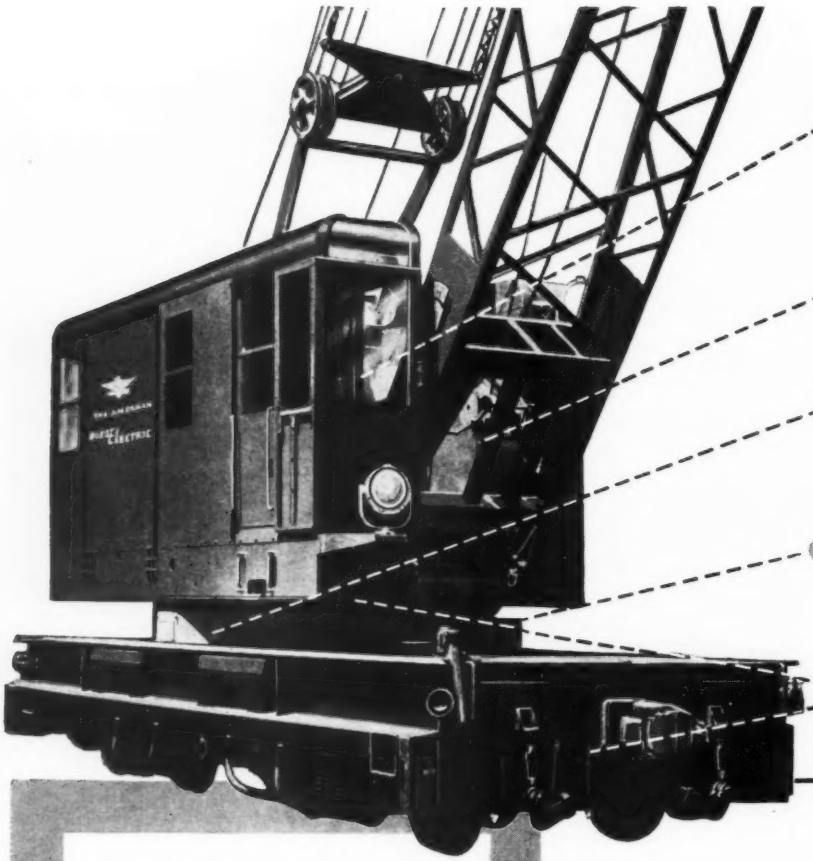
Turn your toughest drilling jobs over to Black & Decker *Heavy-Duty* Electric Drills . . . and watch your output jump! These high-powered Drills handle *continuous,* heavy-duty drilling, wood boring and hole sawing. From spade handle to chuck, they're built to take it! Their heavy-duty, B & D-built motors are specially constructed for constant service. Heavy-duty gears and ball bearings are used throughout. Roller bearings on chuck spindle withstand severe side and end thrust for long, trouble-free operation.

Wherever you are, there's a Black & Decker Distributor near you. Ask him about these Heavy-Duty Drills today. Remember, he's as close as your phone and ready to help on *any* tooling problem. For your copy of our catalog, write to: The Black & Decker Mfg. Co., 663 Pennsylvania Ave., Towson 4, Maryland.

LEADING DISTRIBUTORS EVERYWHERE SELL

**Black & Decker**

**PORTABLE ELECTRIC TOOLS**



**FIRST**
graduated air controls

**FIRST**
with friction clutch boom hoist

**FIRST**
14-inch safety clearance on all models

**FIRST**
roller bearing turntable

**FIRST**
welded carbody and machinery deck

THE American
**DIESELECTRIC**
Locomotive Crane
*Continues an Impressive List of...*
"FIRSTS"!

Here is the remarkable new locomotive crane that writes off its own cost in five years. The crane with "DIESEL power to the deck; ELECTRIC power to the trucks." It's the biggest locomotive crane news of 1947!

For the background of this news, let's look at the record. Named above are five of the most important all-time developments in locomotive crane design. *All five* are American Hoist "firsts"! In addition, more than a dozen other major improvements (travel throw-out clutch, enclosed travel gears, etc.) could be added to the list. Nearly all of these advancements have been adapted or copied widely.

The DIESELECTRIC is, indeed, revolutionary. More than *seven tons* of wearing parts have been eliminated. Maintenance expense has been cut 25% to 50%. Every part of the crane is new—designed specifically and solely for the DIESELECTRIC. The past record of all "American" Locomotive Cranes, and the long years of testing and development that went into the DIESELECTRIC assure it a brilliant future.

*Write today for New Catalog 600-L-4.*

# American Hoist
**and DERRICK COMPANY**
**St. Paul 1, Minnesota**

*Sales Offices:*
New York
Pittsburgh
Chicago
New Orleans
San Francisco

PLANT No. 2 — SO. KEARNY, NEW JERSEY

780

NEW

# Thor BACKFILL TAMPERS

NEW POWER FOR

## FASTER WORK

NEW STREAMLINED DESIGN

## EASIER HANDLING

Just open the valve . . . the new Thor Backfill Tamper will pound more dirt into the hole than you can shovel out of it!

Even the stiffest backfill is pounded solid—*quickly*, with the rapid, powerful blow of this new Thor . . . with a minimum of lifting by the operator. New plate valve and enlarged air ports deliver maximum power under varying air line pressure. Automatic lubrication. Positive-lock butt. Positive air seal.

Call your Thor dealer for a demonstration, or write for circular.

**ACCESSORIES**

**For top efficiency, always specify Thor hose, couplings and clamps.**

**INDEPENDENT PNEUMATIC TOOL COMPANY**

600 W. Jackson Boulevard, Chicago 6, Illinois

Export Division: 330 West 42nd St., New York 18, N. Y.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Birmingham | Boston | Buffalo | Cincinnati | Cleveland | Denver | Detroit | Houston |
| Los Angeles | Milwaukee | New York | Philadelphia | Pittsburgh | St. Louis | St. Paul | |
| Salt Lake City | Seattle | San Francisco | Toronto, Canada | Sao Paulo, Brazil | London, England | | |

Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH-FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

# For *specialized e*
# YOUR LeTOURNEAU

Ask about the 180 h.p., high-speed, big rubber-tired Tournadozer that travels up to 15 m.p.h. Its 4 fast forward AND REVERSE speeds . . . instantaneous, no-shift gear selection . . . air-actuated controls . . . and high-rolling maneuverability can increase efficiency on your construction and maintenance. Works off-track, crosses tracks at will . . . rolls fast job-to-job over pavement or along right-of-way, makes fast on-the-job moves.

To protect your construction and maintenance operations against costly equipment downtime, your LeTourneau Railroad Distributor delivers parts and repair service *where* you need it, *when* you need it. He was especially selected to serve your line because he offers:

**Fast Shop, Field Repair Service** — Competent factory-trained and field-experienced mechanics are always ready to give high-quality and dependable service on your railroad construction equipment.

**Fast Parts Delivery** — He has large shops and stockrooms, carries adequate supplies of LeTourneau parts to promptly service any old or new equipment — genuine, factory-made parts that always fit accurately, cut replacement time and wear longer.

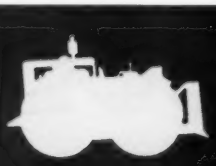
What's more — a single LeTourneau Distributor serves your entire line . . . there are no jurisdictional disputes, no buck passing when equipment is moved from one division to another. He is prepared to back up your equipment with fair dealing and prompt service, regardless of where you use it.

You will also find your Distributor and his men experts on dirtmoving and material handling equipment as applied to railroad construction and maintenance . . . ready to assist you in figuring output and costs . . . to offer suggestions to improve job efficiency with your present equipment . . . to recommend dirtmoving contractors for work you do not care to handle with your own organization.

He's a good friend, worth knowing. It will pay you to call on him *today* . . . and *any* day he can be of service to you.

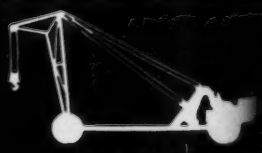
**R. G. LeTOURNEAU, Inc.**
**PEORIA,** *Industrial Sales* **ILLINOIS**

LeT



TOURNADOZERS

TOURNAPULLS



TOURNACRANES

A FULL LINE OF HIGH SPEED, RUBBER TIRED TOOLS AND CRAWLER

# equipment service see RAILROAD DISTRIBUTOR

**• BALTIMORE, *Maryland***
**General Supply & Equipment Co., Inc.**
**530 East 25th Street**

Baltimore & Ohio R.R. System
Maryland & Pennsylvania R.R. Co.
Western Maryland Ry. Co.

**• CLEVELAND, *Ohio***
**Gibson-Stewart Company**
**11730 Harvard Avenue**

Akron, Canton & Youngstown R.R. Co.
Chesapeake & Ohio Ry. Co.
Erie R.R. Co.
The New York, Chicago & St. Louis R.R. Co.
Pere Marquette Ry. Co.
Toledo Terminal R.R. Co.
The Wheeling & Lake Erie Ry. Co.

**• COLUMBIA, *South Carolina***
**Smith Equipment Company**
**1915 Harden Street**

Atlantic & Yadkin Ry.
Atlanta Coast Line R.R.
Carolina & Northwestern Ry. Co.
Charleston & Western Carolina Ry. Co.
Piedmont & Northern Ry. Co.
Winston-Salem Southbound Ry. Co.
Southern Railway System

**• MONTGOMERY, *Alabama***
**Miller G. Williams Machy. Co.**
**Mobile Highway**

Gulf, Mobile & Ohio R.R. Co.
Alabama, Tennessee & Northern R.R. Co.
Apalachicola Northern R.R. Co.

**• OMAHA, *Nebraska***
**Fuchs-Clayton Machinery Company**
**7th & Missouri Ave.**

Laramie, North Park & Western R.R. Co.
Union Pacific Railroad

**• PHILADELPHIA, *Pennsylvania***
**Furnival Machinery Company**
**Lancaster Ave. at 54th Street**

Baltimore & Eastern R.R. Co.
Lehigh & New England R.R. Co.
Pennsylvania-Reading Seashore Lines
The Pennsylvania R.R.
Reading Company

**• PITTSBURGH, *Pennsylvania***
**Dravo-Doyle Company**
**2601 Preble Avenue**

Bessemer & Lake Erie R.R. Co.
The Monongahela Ry. Co.
The Pittsburgh & Lake Erie R.R. Co.
The Pittsburg & Shawmut R.R. Co.
Pittsburgh & West Virginia Ry. Co.

**• ST. LOUIS, *Missouri***
**Rozier-Ryan Company**
**3340 Morganford Road**

Alton & Southern R.R.
Ann Arbor R.R. Co.
Illinois Terminal R.R. Co.
Missouri-Kansas-Texas R.R. Co.
Missouri Pacific Lines
St. Louis-San Francisco Ry. Co.
St. Louis Southwestern Ry. Co.
Terminal R.R. Assn. of St. Louis
Wabash R.R. Co.

**• OAKLAND, *California***
**Soule' Equipment Company**
**Freight & Ferry Streets**

Southern Pacific Co. (Pacific Lines)
Western Pacific R.R. Co.
Northwestern Pacific R.R. Co.
Sacramento Northern Ry.
San Diego & Arizona Eastern Ry. Co.
Tidewater Southern Ry.

***Get in touch with your LeTourneau Railroad Distributor... he's ready to help with your problems on dirtmoving, coal storage, off-track hauling and lifting. Additional LeTourneau Railroad Distributors will be announced in this publication. Watch for them. If your Railroad isn't listed, contact R. G. LeTourneau, Peoria, Illinois.***

*Trademark Reg. U.S. Pat. Off. 8818 Tournadozer — Trademark

TOURNATRAILERS*

CARRYALL* SCRAPERS

ROOTERS*

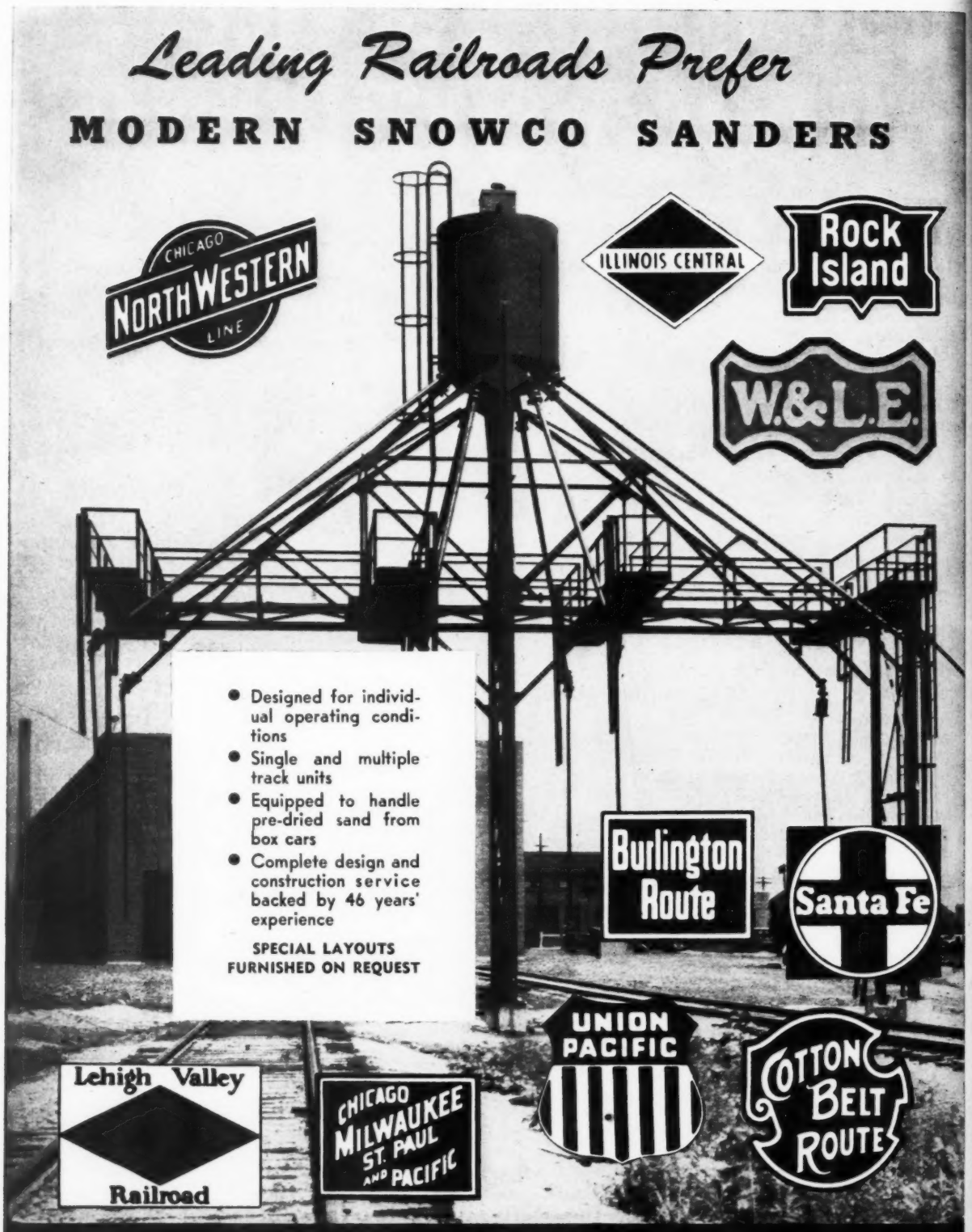
SHEEP'S FOOT ROLLERS

POWER CONTROL UNITS

TRACTOR EQUIPMENT FOR *Off-Track* CONSTRUCTION AND MAINTENANCE

# *Leading Railroads Prefer*

## MODERN SNOWCO SANDERS




- Designed for individual operating conditions
- Single and multiple track units
- Equipped to handle pre-dried sand from box cars
- Complete design and construction service backed by 46 years' experience

**SPECIAL LAYOUTS FURNISHED ON REQUEST**

# T. W. SNOW CONSTRUCTION CO.

9 So. Clinton St., Chicago 6

# Power
# Convenience
# Comfort

*When it comes to Railroad Equipment...*

*Ample power* to handle heavily loaded trailers ... *Convenience* that eliminates handling problems when the crew is small ... *Added Comfort* afforded by the metal cab ... the Fairbanks-Morse 53D has them all—a 6 to 8 man standard section motor car used by railroaders all over the world.

**FAIRBANKS-MORSE**

*A name worth remembering*

DIESEL LOCOMOTIVES • DIESEL ENGINES
STOKERS • SCALES • MOTORS • GENERATORS
PUMPS • FARM EQUIPMENT • MAGNETOS
RAILROAD MOTOR CARS and STANDPIPES

# ALLIS-CHALMERS

# HD-5

# NEW THR

## HD-5

### with

### TRACTO-SHOVE

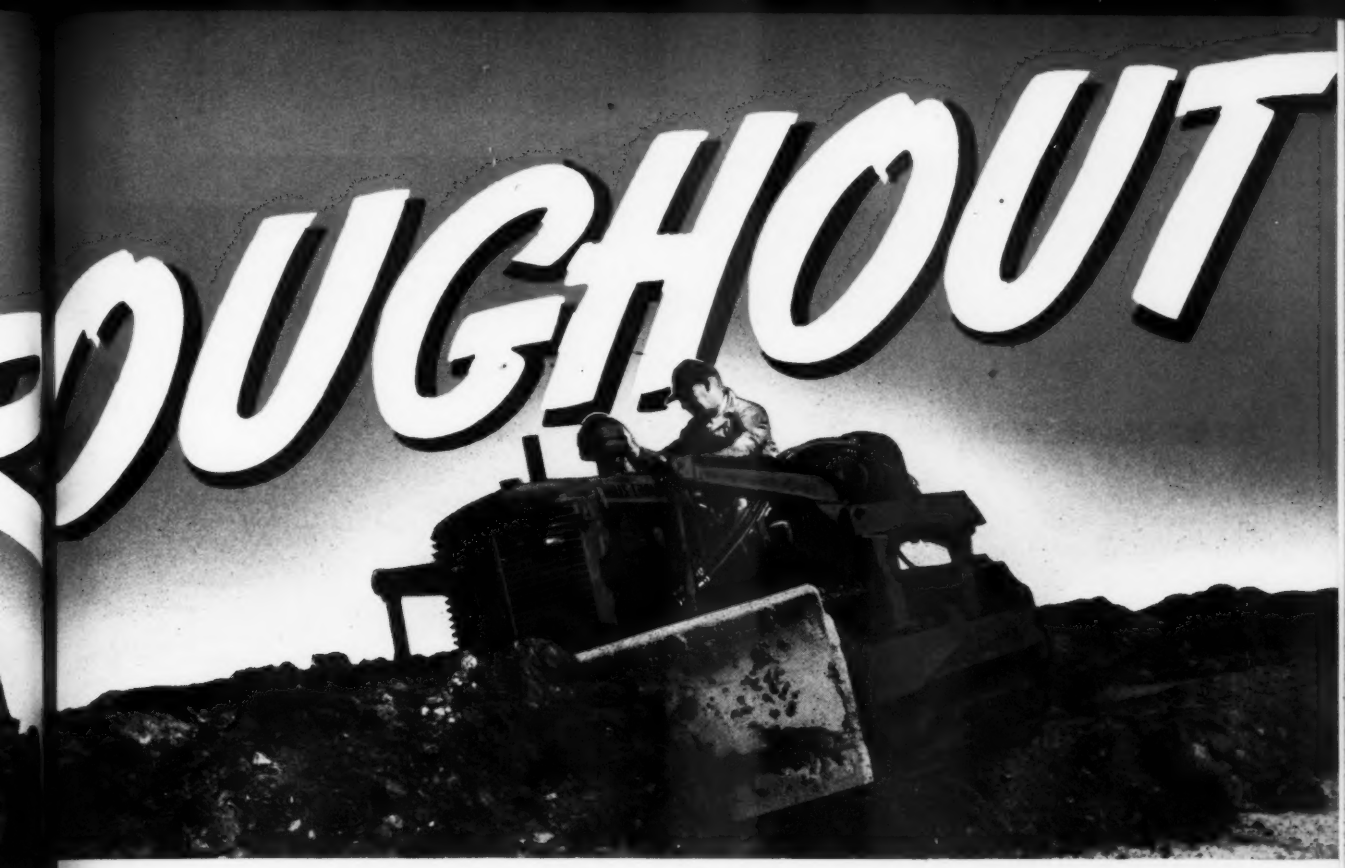
Interchangeable attachments f
shovel include ¾ and 1 cu. y
material handling bucket, buc
teeth, bulldozer blade, 2 cu. y
snow loader bucket and V-ty
snow plow.

A 2-wheel scraper may also
used with this outfit. Scraper c
be operated with shovel hydrau
system or its own hydraulic syste

Use this versatile combinati
for right-of-way construction a
maintenance, handling balla
snow-removal, backfilling, layi
and moving tracks, clearing wrec
all kinds of hauling.

**the HD-5 is**
**COMPLETELY NEW**
**IN DESIGN**

**Weighs Approx. 11,000 lbs.**
**2-cycle GM Diesel Power**




# NEW PERFORMANCE... NEW WORK CAPACITY ...NEW SIMPLIFIED SERVICING

**PERFORMANCE**

Instant starting.

Quick pick-up.

Fast maneuvering.

Comfortable operation.

Rugged and dependable.

**WORK CAPACITY**

Increased lugging ability because of built-in characteristics of General Motors 2-Cycle Diesel engine.

More footing and greater traction to handle larger loads under a wider range of conditions.

Tractor weight balanced for most efficient drawbar and front-mounted equipment use.

**SIMPLIFIED SERVICING**

Tractor construction permits separate and convenient removal of major assemblies.

Greasing intervals lengthened—1,000 hours for truck wheels, front idlers and support rollers.

Lubrication fittings reduced in number and made readily accessible.

Adjustments easily reached and quickly made.

***Get the full story of this great, new diesel tractor from your Allis-Chalmers dealer.***

# ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

# These tracks beside these tracks

## *mean economical maintenance*

When you see the track marks of an Oliver "Cletrac" crawler tractor along the right-of-way, you can be certain that the road is getting the most for its maintenance dollar.

This "handyman" of the maintenance crew works off-track . . . does not impede rail traffic. With its auxiliary equipment, an Oliver "Cletrac" can perform the majority of road maintenance tasks such as snow removal, tie tamping, ditch cutting and cleaning, grading, embankment building, welding and many other maintenance and construction tasks.

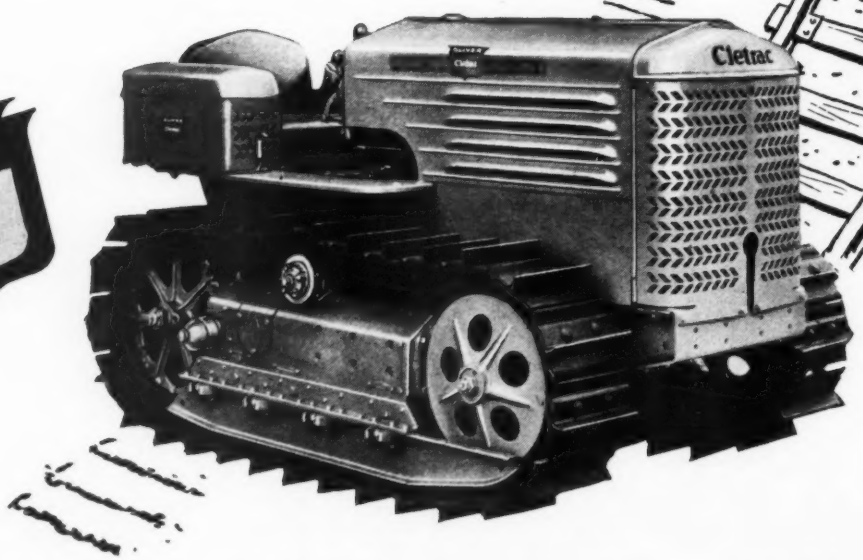
Use of an Oliver "Cletrac" frequently eliminates the need for expensive work trains. It carries its own equipment off-track from work site to work site. Long cables are eliminated . . . jobs speeded. There are no job hold-ups while equipment is loaded or unloaded . . . no need to move equipment to a siding or off the track while rolling stock is passing.

For all the facts, see your Oliver "Cletrac" Dealer or write The Oliver Corporation, Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio.

**Cletrac**

**a product of**

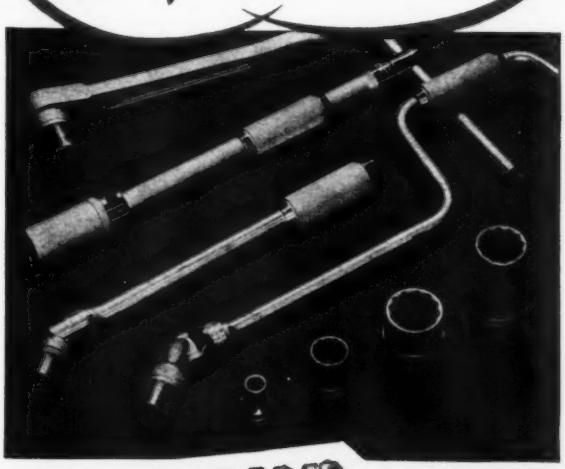
**The OLIVER Corporation**




OLIVER Cletrac SALES SERVICE

*"THE SIGN OF EXTRA SERVICE"*

# SURE-GRIPPING *Power* WITH WILLIAMS "*Supersockets*"



● For the extra *safety* and the extra *power* that's possible only with a sure-gripping wrench . . . pick a Williams "Supersocket." And there are many other advantages to be found in these versatile wrenches . . . greater speed, extreme adaptability, less fatigue are but a few.

Williams "Supersockets" are available in 5 different patterns, having various handles, parts and socket types, with drives ranging from 1/4" to 1" square. Socket openings from 3/16" to 3-1/8".

WILLIAMS

• OUR DISTRIBUTOR IS YOUR LOCAL WAREHOUSE

J. H. WILLIAMS & CO., BUFFALO 7, N. Y. *Distributors Everywhere*

# MATCHED EARTHMOVERS SPEED SANTA FE JOB

"Caterpillar" Diesel D7 Tractor and matching "Caterpillar" No. 70 Scraper building railroad sub-grade on the Santa Fe. *(Price of standard model D7 Tractor, without cable control unit, $7960; No. 70 Scraper, $6050—both F.O.B. Peoria, subject to change without notice.)*

George Stout, Merced, Calif., owner of the matched "Caterpillar" equipment that did the job.

"Caterpillar" Diesel Tractors, teamed with the "Caterpillar" Scrapers and Bulldozers that are designed and built for top performance with each model, are setting new records on right-of-way construction work.

A "Caterpillar" Diesel D7 Tractor and No. 70 Scraper recently completed a job in fast time on the Santa Fe R. R. near Guernsey, California. In just 7 days they moved 7000 yards of earth and built 3800 feet of sub-grade for the realignment of a curve on the main line.

Says George Stout, the contractor who did the work:

"This outfit will dig hard-pan and do it so well it runs a ripper out of a job. The scraper loads easily and spreads evenly, and with those big tires it 'floats' over the job plenty fast. I know from experience that 'Caterpillar' equipment operates more hours for less money."

**CATERPILLAR**
REG. U. S. PAT. OFF.
**DIESEL** ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

**CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS**

# 101 RAILROADS
## Use SPERRY RAIL SERVICE Regularly

## To Find ALL Types of Rail Head Defects

One of more than 25,000 Vertical Split Heads found by Sperry during 1946

**A REAL BONUS IN RAIL SAFETY— NOT OBTAINABLE WITH ANY OTHER RAIL TESTING METHOD!**

Over 37,000 defective rails containing Longitudinal Defects (Vertical and Horizontal Split Heads) were found by Sperry Detector Cars in 1946 — an average of almost 20 per 100 track miles tested. These were in addition to the more than 45,000 Transverse Defects detected during the same period.

**ONLY SPERRY *Induction-Type* DETECTOR CARS** are able to indicate Longitudinal Defects in track.

**HIGH TRAIN SPEEDS, GREATER TONNAGE,** demand maximum protection against defective rails provided by Sperry Cars which also find —

**MORE *and* SMALLER TRANSVERSE DEFECTS** than any other method of rail testing.

## WHY
### LONGITUDINAL DEFECTS ARE IMPORTANT!

**BECAUSE**

1. ***Serious derailments*** have been caused by both types of Longitudinal Defects.
2. ***Rapid Growth*** of Longitudinal Defects extends along the entire length of the seam from which they develop. Usually more than one such seam is present in the same rail.
3. ***Compound Fissures*** often develop from Longitudinal Defects — still further increasing the hazard to rail safety.

SP-114

## SPERRY RAIL SERVICE

**DIVISION OF SPERRY PRODUCTS, INC.**
**Chicago, Ill., HOBOKEN, N. J., St. Louis, Mo.**

**BEALL Hi-Duty SPRING WASHERS** are made especially to stand the strain of the heavy-duty rail service required by today's high-speed freight and passenger trains.

These washers are strong and tough, yet provide the necessary "springing action" required at rail joints, frogs and crossings.

We control every step of their manufacture—from the specification of the specially-developed formula and process used in making the steel to the forming, hardening, tempering and testing operations.

**BEALL TOOL DIVISION** *of Hubbard & Co.*
EAST ALTON, ILL.

Specialist Manufacturers of Spring Washers

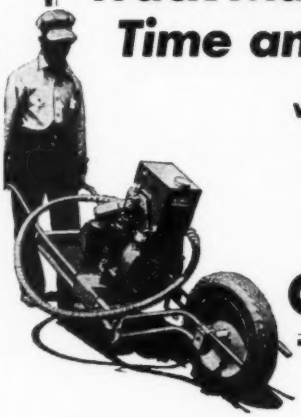
**BEALL Hi-Duty SPRING WASHERS**
MADE ESPECIALLY FOR RAILROAD SERVICE

# REDUCE...

## Track Maintenance Time and Cost

with a Mall TRADE MARK

## PORTABLE RAIL GRINDER



- ★ *Off-The-Track*
- ★ *Easily Portable*
- ★ *Efficient*
- ★ *Safe*
- ★ *Economical*

You can reduce wear and tear on rolling stock, reduce road bed maintenance and increase rail life with this powerful, light weight off-the-track 6 H.P. Mall Rail Grinder. The variable speed gasoline engine provides abundant power for smoothing off rail joint welds, grinding frogs, switch points and crossings.

Attachments, quickly interchangeable with grinding wheels, can be furnished for drilling rails, ties and crossing planks, drilling holes for lag screws, wire brushing and other jobs. The patented slip lock detail on ends of heavy duty flexible shafting and on various attachments speeds up tool changing. Ruggedly constructed to stand up under hard continuous use. Pneumatic wheel makes for easy rolling. This unit will quickly repay its original cost in lower maintenance and grinding costs.

*Complete Catalog Upon Request*

Railroad Department

**MALL TOOL COMPANY**

7746 South Chicago Ave. Chicago 19, Illinois

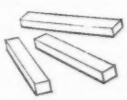
MALL REPRESENTATIVES: Power Tools, Inc., St. Paul; Allied Tools & Supply Co., Louisville; John N. Thorp Co., New York.

Mall REG U.S. PAT. OFF. PORTABLE POWER TOOLS

## *Here's how to PROFIT from SAVINGS with*

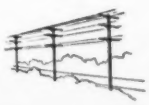
# PRESSURE-TREATED WOOD

There are seven important economies suggested in this picture. How many can you spot . . . and how many are you making on *your* lines? The answer is important. For today, more than ever before, *railroad profits must come from savings.* And every place that wood is used, *pressure-treated* wood can help to cut your costs.



**CROSS TIES**

Your own tie records will show the economy of pressure-treated wood. Savings from this source alone averaged 20% of railroad profits during a recent ten-year period.



**POLES AND POSTS**

The lower cost per year of full-length pressure-creosoted poles and posts has been demonstrated by countless utility and highway installations. Further—Koppers will handle your poles on a contract basis, just as your ties are handled now.

**PLATFORMS**

The "mechanical" failures that force frequent platform repairs generally *start* from decay. Pressure-treatment extends life, helps to minimize wear.

**BRIDGES AND CROSSINGS**

One major railroad reports over 40 years service from their pressure-treated wood bridges; total annual charges often run less than interest charges alone on bridges built of other materials. Koppers Crossings save on maintenance and replacement.

**FIRE-RETARDANT CONSTRUCTION**

Koppers CZC(FR) treatment for lumber and structural members greatly expands the possible applications for wood. Treatment gives a high degree of fire-retardance, also protects against termites and decay. A new bulletin, "Koppers Fire-Retardant Wood" gives full details.

K KOPPERS

**PRESSURE-TREATED WOOD**

KOPPERS COMPANY, INC.

PITTSBURGH 19, PENNSYLVANIA

Main line and auxiliary equipment of all kinds using Timken Roller Bearings have these advantages in common: constant availability for service; ability to keep going for maximum periods without shopping; minimum attention for lubrication and maintenance.

American railroads use Timken Bearings in locomotives, passenger cars and streamlined trains to enable them to operate heavier trains on faster schedules.

They use Timken Bearing Equipped section motor cars to help maintain their tracks in sound, safe condition at all times. When buying new section cars of any type it will pay you to ask this question: "Are they equipped with Timken Bearings?" If you are a car builder, look for the trade-mark "TIMKEN" on every bearing you install. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

48 Years of Engineering and Metallurgical Development

# MOUNTAINS (OF DIRT) FROM A "MOLE"

The mountain range above is only two feet high but it represents the peak of roadbed maintenance efficiency. Just a flick of the switch starts the new model McWilliams "Mole" Ballast Cleaner through the ballast of your road, sifting out unwanted cinders and dirt as it moves forward 3 feet per minute.

**RAILWAY MAINTENANCE CORP.**

PITTSBURGH 30, PENNSYLVANIA

# For MAXIMUM Savings on *major ballast placing operations*

## *the Revolutionary* JACKSON *multiple tamper*

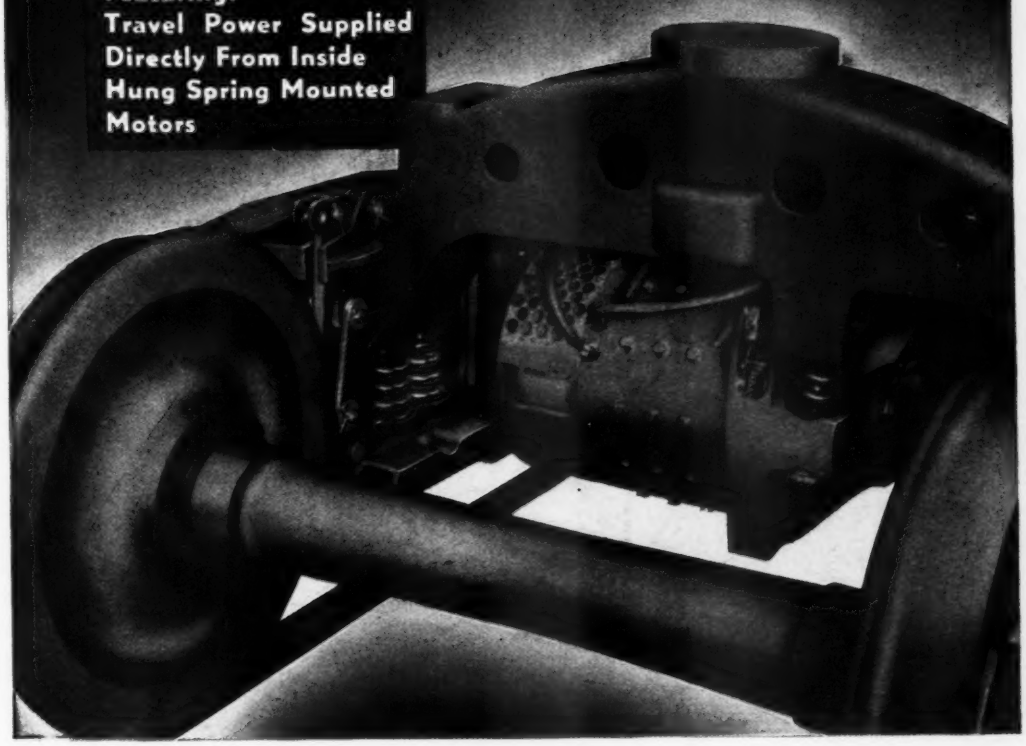
Note how tamping blades are directed under the ties to firmly consolidate a maximum amount of ballast beneath the rails.

The Jackson Multiple Tamper is a finished, thoroughly service-proven machine in all respects. One man operates the 12 tampers simultaneously, thus completely removing the human variable and assuring perfect uniformity of tamping. It firmly compacts all classes of ballast under the ties, and is especially designed to *complete the surfacing job in one operation* — at the rate of 3 to 5 ties a minute under average conditions. The results are vastly increased track feet surfaced daily with minimum men, and equally important, the elimination of any necessity for subsequent spotting or smoothing operations. The track stays "put." For moderate to high lift-of-track jobs in new or old work, this equipment is beyond comparison — the ultimate achievement of more than a quarter century of experience in this field. Each machine is guaranteed to perform as claimed. Orders for 1948 delivery should be placed promptly.

**ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Michigan**

# BROWNHOIST DIESEL ELECTRIC LOCOMOTIVE-CRANES • CAPACITIES 30 TONS AND UP

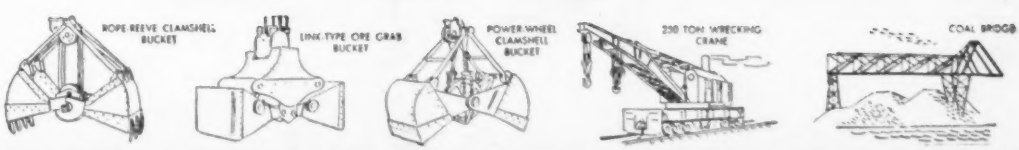
Featuring:
Travel Power Supplied
Directly From Inside
Hung Spring Mounted
Motors



Take a good look at the truck illustrated. It's just *one of the many reasons* why the new Brownhoist Diesel Electric Locomotive-Crane gives you top efficiency in car switching and materials handling at lowest cost. The two electric motors are hung inside the crane trucks, spring suspended from the bolster. Travel power is supplied directly to the axles, eliminating clutches and high maintenance gearing. The result? *Reduced maintenance in heavy travel service.*

And that's typical of the superior design and construction throughout this new Brownhoist crane that *doubles as a powerful, quick-accelerating (up to 15 M.P.H.) switch engine.* Motor current is supplied by generator connected directly to the diesel engine. Power for hoist, swing and booming is transmitted through a helical gear reducer. Boom hoist is driven by safe-operating worm and wheel. All boom cable is taken on the drum in one lap, hence no over winding. And of course there's the famous patented Brownhoist Monitor-type cab that provides the operator with 360° visibility and full view of hoist and boom drums for safer, faster crane operation. **Write today for complete facts.**

## BROWNHOIST BUILDS BETTER CRANES




**INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICH. • DISTRICT OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO • AGENCIES: DETROIT, BIRMINGHAM, HOUSTON, LOS ANGELES, PORTLAND, SAN FRANCISCO, SEATTLE, SPOKANE, CANADIAN BROWNHOIST LTD., MONTREAL, QUEBEC.**

# THE TAMPER

# ...that gets under Frogs and Switches

Even under switches and frogs it's easy to use the CP-5 Gasoline Tie Tamper. Its slender lower end adapts it for use in narrow places, and its compact engine design permits an unobstructed view of the work.

Starting is quick and easy — by pressure on one of the grip handles.

Balance is perfect — weight is centered between grip handles.

Vibration is minimized in grip handles by air-cushioning of return stroke of free-throw striking piston — machine life is prolonged.

Magneto provides efficient ignition system under all conditions — there are no batteries, thus eliminating costly battery replacements.

Standard two-cycle engine operates on gasoline-oil fuel mixture — oil in fuel provides automatic lubrication.

***Write for Bulletin 1943—Maintenance-of-Way Equipment.***

**CHICAGO PNEUMATIC TOOL COMPANY**

General Offices: 8 East 44th Street, New York 17, N. Y.

AIR COMPRESSORS • ELECTRIC TOOLS • PNEUMATIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



*For additional information, use postcard, pages 131-132*

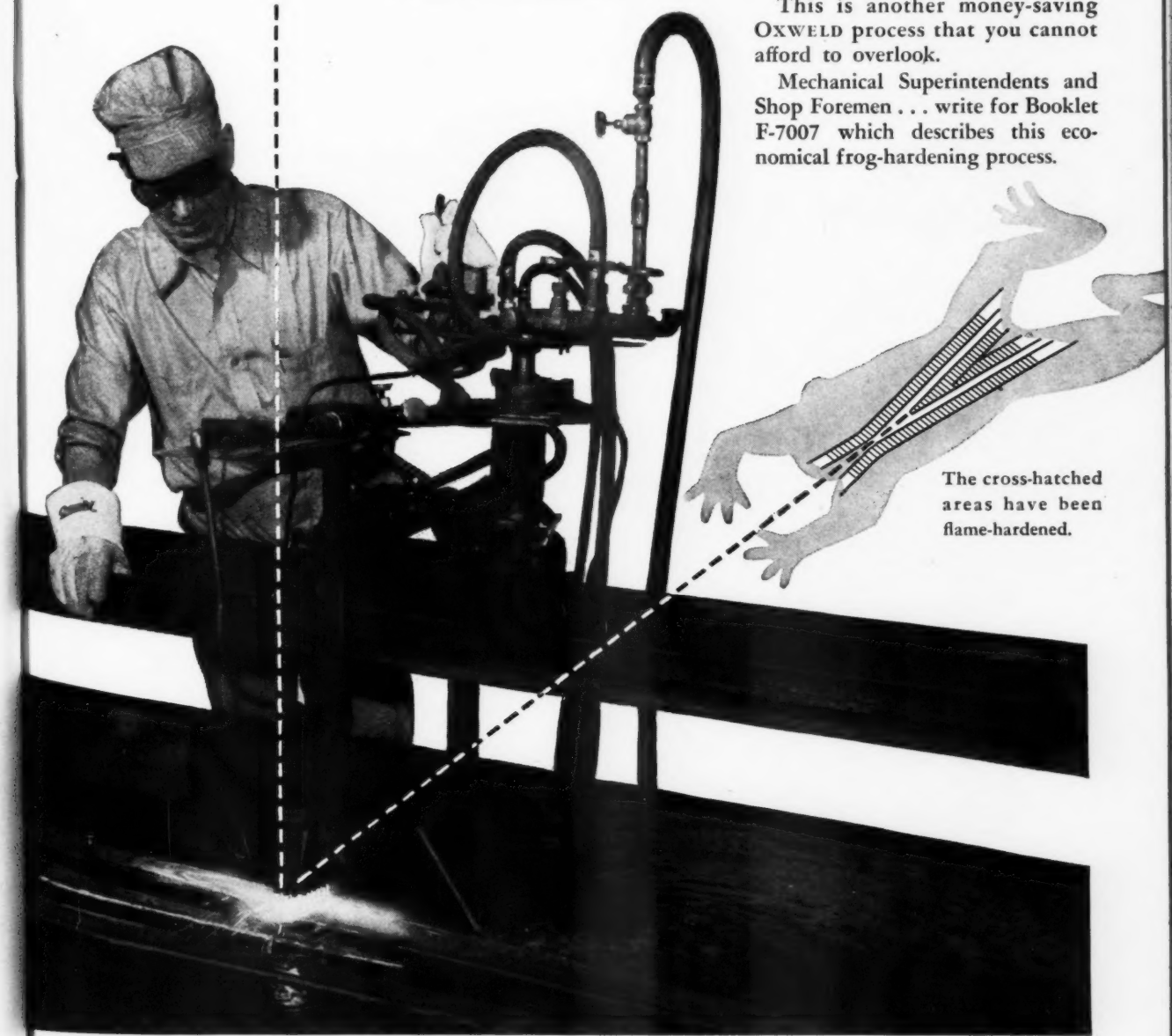
# FROGS can have 9 lives too

When carbon steel frogs are oxy-acetylene flame-hardened, their running surfaces will last up to nine times as long as untreated frogs.

This recently developed OXWELD method is simple and economical. A single multiflame heating head is used—no extra heating is required to draw or temper the hardened areas, and no special coolants are needed. Treated surfaces have uniform hardness values, correct hardness depth.

This is another money-saving OXWELD process that you cannot afford to overlook.

Mechanical Superintendents and Shop Foremen . . . write for Booklet F-7007 which describes this economical frog-hardening process.



The cross-hatched areas have been flame-hardened.

This flame-hardening blowpipe is mounted on a standard OXWELD CM-16 cutting machine.

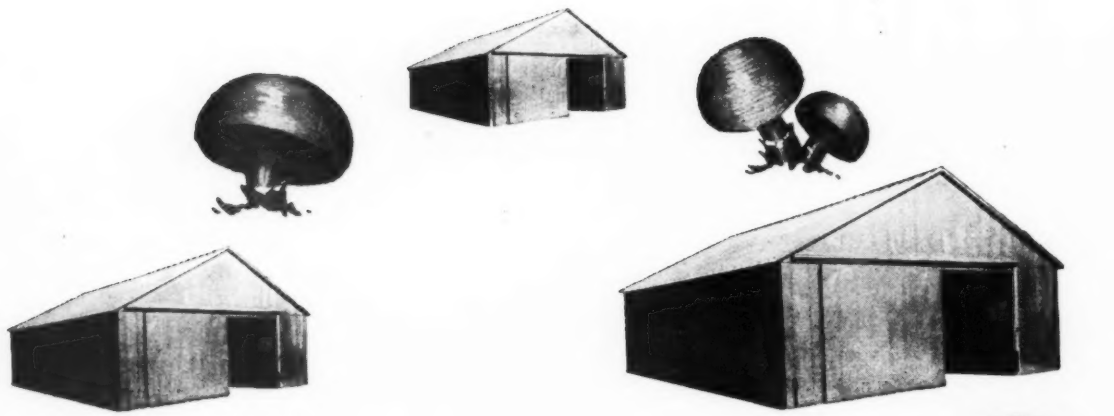
**THE OXWELD RAILROAD SERVICE COMPANY**
*Unit of Union Carbide and Carbon Corporation*
UCC
Carbide and Carbon Building Chicago and New York
In Canada:
Canadian Railroad Service Company, Limited, Toronto

The word "Oxweld" is a registered trade-mark.

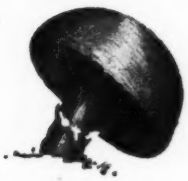
OXWELD RAILROAD SERVICE

P-21

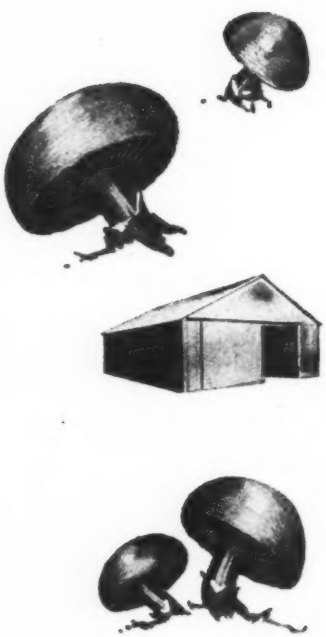
SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS



# *Mushrooms and Steelox*



## have something in common



STEELOX Buildings are so easy to erect they seem to pop up overnight. But there the similarity ends. You get a strong, tight, fire-resistant structure that is exceptionally low in cost.

Many railroad men praise ARMCO STEELOX as the answer to their permanent or temporary building problems. Prompt delivery and quick erection are not the only reasons. With all their strength, STEELOX Panels are light and easy to handle. Unskilled labor does the work with simple instructions. The completed building is easy to wire and can be insulated. And whenever necessary STEELOX Buildings can be taken down and put up on another site.

Painting is easy because STEELOX Panels are made of Galvanized PAINTGRIP Steel. They can be painted immediately without acid etching or other pre-treatment. Long paint life is assured.

ARMCO STEELOX Buildings are just the thing for signal houses, warehouses, pump houses, tool houses, motor car garages, diesel facilities, and other installations where you need a permanent, easily-erected structure. Mail the coupon below for prices and complete data on your specific needs. Armco Drainage & Metal Products, Inc., 1595 Curtis Street, Middletown, Ohio.

*Export: Armco International Corporation.*

**Send me data on ARMCO STEELOX Buildings**

**Type of Building** _____

**Approximate Size** _____

**Name** _____

**Street** _____

**City** _____ **State** _____

ARMCO

**ARMCO**

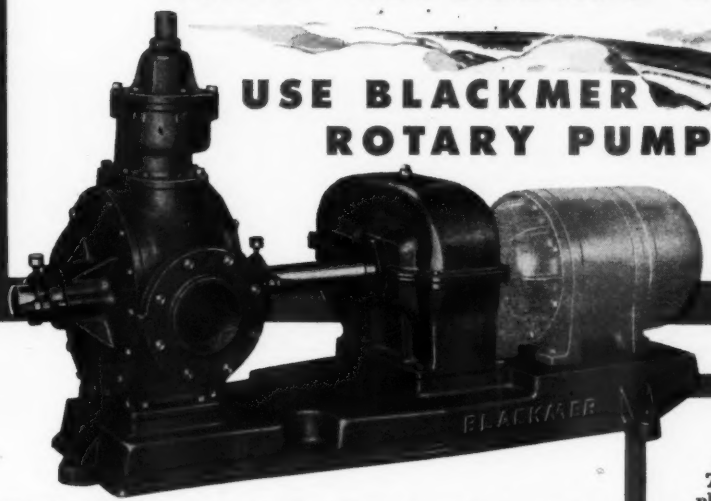
**STEELOX BUILDINGS**



*For additional information, use postcard, pages 131-132*

# HOW TO *Reduce Terminal Time* WHEN REFUELING DIESELS

## USE BLACKMER ROTARY PUMPS



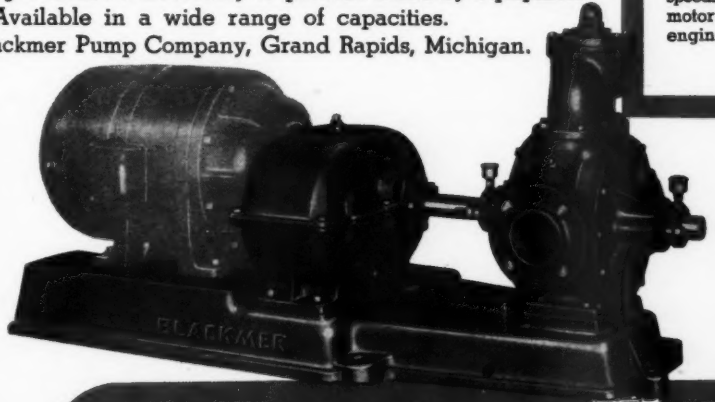

Dieselized divisions of the New York Central, Santa Fe, Chesapeake & Ohio, Burlington, Union Pacific, Chicago and North Western, and many other leading railroads now depend on Blackmer pumps for fast refueling at terminals.

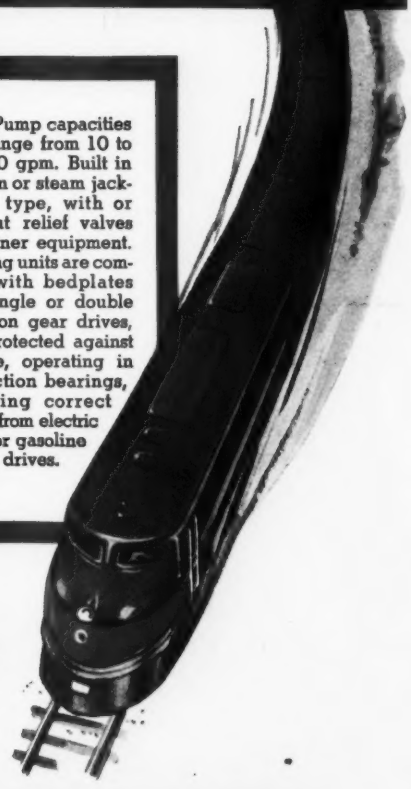
Blackmer pumps are built with oversize capacity. Exclusive design features provide compensation for wear . . . insure full, continuous delivery. Removable liner and pumping elements provide for quick and easy servicing without disturbing the initial installation. This feature no longer makes it necessary to provide stand-by equipment.

Available in a wide range of capacities.

Blackmer Pump Company, Grand Rapids, Michigan.

Pump capacities range from 10 to 750 gpm. Built in plain or steam jacketed type, with or without relief valves or strainer equipment. Pumping units are complete with bedplates with single or double reduction gear drives, fully protected against leakage, operating in antifriction bearings, providing correct speeds from electric motor or gasoline engine drives.



**BLACKMER PUMPS**

*Self-Adjusting for Wear*

Power Pumps • Dry Cleaning Pumps • Sanitary Pumps • Truck Pumps • Strainers • Hand Pumps

# How to Reduce Rail Cropping Costs

Save the time and expense involved in hauling rails long distances to a centra- plant for cropping.

The Airco portable rail cropping machine enables you to set up a rail cropping plant at any point along the right of way convenient to the job and to move it quickly to suit changing requirements.

You can even crop rails in the track when necessary. Weighing only 61 pounds, the Airco portable rail cropping machine is easily moved about by one man.

Employing two highly-efficient oxyacetylene flame cutting tips, it will produce as many as 30 cuts per hour, giving a quality surface that requires a minimum of grinding.

For complete information on this modern maintenance machine, mail the coupon for illustrated four page folder. Address Air Reduction, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Product: Company, Houston 1, Texas.

**AIRCO AIR REDUCTION**

*Offices in All Principal Cities*

*Costs Come Down Under the Airco Plan*

REM

AIR REDUCTION
60 East 42nd Street
New York 17, N. Y.

Please send a copy of the Rail Cropping Machine folder to

Mr. _____

Title _____

Road _____

Address _____

City _____ Zone _____ State _____

# ADDITIONAL INFORMATION

*On Any of the Products Mentioned in This Issue*

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

## Products Index


A

Adzes ..... 191
Aggregate Meters ..... 182
Air Compressors ..... 126, 173, 196
Anchors ..... 171, 183, 195
Anchor Spikes ..... 166
Asphalt ..... 100
Axles ..... 138

B

Backfill Tampers ..... 109
Ballast Cleaners ..... 123
Ballast Discers ..... 138
Bars ..... 191
Bench Stands ..... 107
Bladers ..... 138
Bolt Tighteners ..... 104
Bolts ..... 99, 117, 190
Buckets ..... 125, 182, 188
Bulldozers ..... 110, 111

C

Cement ..... 185
Centrifugal Pumps ..... 196
Chain Pipe Tongs ..... 117
Chemical Weed Killers ..... 181
Chisels ..... 117, 191
Clamps ..... 117
Clamshell Buckets ..... 125, 182, 188
Coal Bridges ..... 125
Concrete ..... 185
Concrete Mixers ..... 196
Concrete Plants ..... 182
Concrete Vibrators ..... 186
Contractors ..... 180
Cranes ..... 101, 108, 110, 111, 125, 135, 180, 184
Crawler Compressors ..... 173
Crawler Cranes ..... 110, 111
Creosote Sprayers ..... 104
Cribbing Machines ..... 177
Cropping Machines ..... 130
Crossings ..... 99, 140, 175, 194

D

Derrick Cars ..... 138
Detector Cars ..... 119
Diesel-Electric Cranes ..... 108, 125
Diesel Engines ..... 113, 126
Diesel Oil Columns ..... 174
Diesel Tractors ..... 114, 115, 116
Draglines ..... 101, 135
Drills ..... 137, 177, 186, 187, 191
Drinking Fountains ..... 190

E

Earthmoving Equipment ..... 110, 111, 114, 115, 118
Electric Drills ..... 107, 186
Electric Grinders ..... 186
Electric Hammers ..... 186
Electric Sanders ..... 186
Electric Saws ..... 187
Electric Tampers ..... 124
Electric Tools ..... 107, 109, 128
Electrodes ..... 102
Emulsified Asphalt ..... 100
Engines ..... 118, 138, 166, 172, 189
Extinguisher Cars ..... 138
Eye Bolts ..... 117

F

Feed Screws ..... 107
Fire-Retardant Treatment ..... 121
Flame Hardening ..... 127
Flange Jacks ..... 117
Floor Material ..... 103
Floor Resurfacer ..... 103, 184
Fountains, Portable Drinking ..... 190
Frog Plates ..... 99
Frogs ..... 99, 175, 194

G

Galvanized Sheets ..... 184
Galvanized Siding ..... 184
Gasoline Engines ..... 172, 189
Gasoline Tie Tampers ..... 126, 133
Gauge Rods ..... 99, 134
Generators ..... 113
Grading Equipment ..... 110, 111, 114, 115, 118, 184
Grapples ..... 182
Grinders ..... 120, 186, 187
Grouting Outfits ..... 138
Guard Rail Clamps ..... 175, 192
Guard Rails ..... 99, 140, 175, 194

H

Hammers ..... 117, 186
Hand Tools ..... 117
Hoist Hooks ..... 117
Hole Saws ..... 107
Hook Bolts ..... 190
Hose & Accessories ..... 109
Hydrants ..... 174
Hydraulic Jacks ..... 193
Hydraulic Tools ..... 126

J

Jacks ..... 177, 193
Joint Bars ..... 99



Postage Will Be Paid by Addressee

BUSINESS REPLY CARD

First Class Permit No. 23410, Sec. 510, P.L.&R., Chicago, Ill.

RAILWAY ENGINEERING & MAINTENANCE

30 CHURCH STREET

NEW YORK 7, NEW YORK

(Please Fill Out Card in Full)

RAILWAY ENGINEERING AND MAINTENANCE

February, 1948

L

Lathe Dogs ..... 117
Lever Jacks ..... 193
Locomotive Cranes ..... 108, 125
Lubricants ..... 182
Lubricators ..... 193

M

Magnetos ..... 113
Magnets ..... 178
Mauls ..... 191
Metal Piles ..... 179
Mobile Cranes ..... 180
Motor Car Accessories ..... 113
Motor Cars ..... 113, 138
Motor Graders ..... 118
Motors ..... 113
Multiple Tampers ..... 124

N

Nibblers ..... 187

O

Oil Spray Cars ..... 138
Oxyacetylene Rail Cropping ..... 130
Oxyacetylene Service ..... 127

P

Paints ..... 184
Paving Breakers ..... 105, 186, 196
Picks ..... 191
Piles ..... 179
Pipe Cleaning ..... 187, 190
Pipe Lining ..... 187
Pipe Vises ..... 117
Pliers ..... 117
Pneumatic Grouters ..... 196
Pneumatic Saws ..... 187
Pneumatic Tampers ..... 196
Pneumatic Tool Lubricators ..... 193
Pneumatic Tools ..... 109, 126, 196
Power Jacks ..... 177
Power Units ..... 110, 111
Power Wrenches ..... 137, 177
Prefabricated Buildings ..... 128, 185
Pull Shovels ..... 101
Pumps ..... 113, 129, 188, 193, 196
Punches ..... 117, 191
Push Cars ..... 138

R

Rail Anchors ..... 171, 183, 195
Rail Braces ..... 99, 140, 194
Rail Drills ..... 137, 177, 191
Rail Grinders ..... 120, 177
Rail Joint Oilers ..... 104
Rail Lubricators ..... 140
Rail Packing ..... 123
Rail Saws ..... 189
Rail Service ..... 119
Rail Testing ..... 119
Rails ..... 99
Resurfacers ..... 103, 184, 186
Roadbed Stabilization ..... 180
Rock Drills ..... 126
Roller Bearings ..... 122, 138
Rooters ..... 110, 111
Rotary Pumps ..... 129
Rust Preventives ..... 176

S

Sanders ..... 186, 187
Sanding Units ..... 112
Saws ..... 187, 189
Scales ..... 113
Scarifiers ..... 113
Scrapers ..... 110, 111, 186
Screw Drivers ..... 117
Screw Jacks ..... 193
Sheep's Foot Rollers ..... 110, 111
Shovels ..... 101, 135
Sledges ..... 191
Socket Wrenches ..... 117
Spike Hammers ..... 177
Spike Rollers ..... 177
Spikes ..... 99
Spot Boards ..... 138
Spring Washers ..... 97, 98, 120
Standpipes ..... 113
Steel Buildings ..... 128
Steel Tapes ..... 193
Stick Lubricants ..... 182
Stokers ..... 113
Surface Hardening ..... 127
Switch Heaters ..... 99
Switch Points ..... 140
Switch Rods ..... 140
Switch Stands ..... 99, 140
Switches ..... 99, 175, 194

T

Tampers ..... 124, 126, 133, 196
Tapes ..... 193
Thumb Screws ..... 117
Tie Borers ..... 137
Tie Cutters ..... 104
Tie Pads ..... 134
Tie Plates ..... 99
Tie Scorers ..... 104
Tie Tampers ..... 124, 126, 133, 196
Tie Tongs ..... 192
Timber Tongs ..... 192
Tongs ..... 191, 192
Tool Holders ..... 117
Track Jacks ..... 193
Track Shifters ..... 137
Track Wrenches ..... 177
Tractors ..... 101, 116, 118, 135, 184
Trailers ..... 110, 111, 138, 192
Treated Lumber ..... 121

U

Unit Tampers ..... 126, 133

V

Vacuum Pumps ..... 126

W

Water Columns ..... 174
Waterproofing ..... 186
Weatherproofing ..... 186
Weed Burners ..... 104, 138
Weed Killers ..... 165, 181
Weed Mowers ..... 138, 164
Weed Sprayers ..... 138
Welding Electrodes ..... 102
Welding Rods ..... 102
Welding Service ..... 102
Well Water Systems ..... 189
Wheels ..... 138
Wood Preservation ..... 121
Wrecking Cranes ..... 125
Wrenches ..... 117, 191

Z

Zinc ..... 194



RAILWAY ENGINEERING AND MAINTENANCE

Please send me additional product information as requested below.

☐ Literature Only ☐ Desire to see Representative ☐ Price Data

Product and Page No.

" " "

" " "

" " "

Name .....

Title or Position .....

Company .....

Address .....

City ..... Zone ..... State .....

(Please Fill Out Card in Full)

February, 1940

Postage Will be Paid by Addressee

BUSINESS REPLY CARD

First Class Permit No. 32418, Sec. 510, P.L.&R., Chicago, Ill.

RAILWAY ENGINEERING & MAINTENANCE

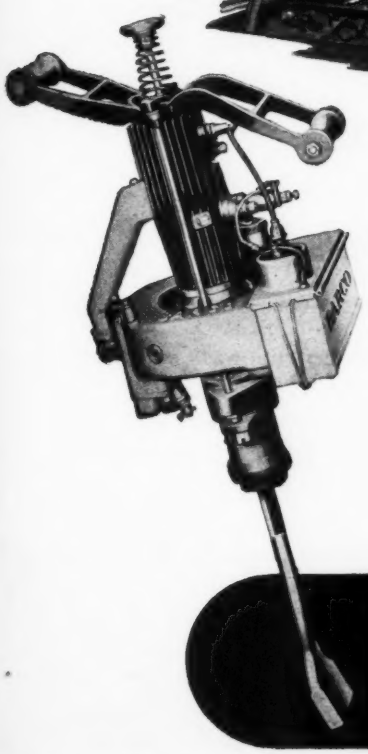
30 CHURCH STREET

NEW YORK 7, NEW YORK

READER SERVICE DEPT.

No Postage Stamp Necessary if Mailed in the United States

# MAKE HIGH LABOR COSTS LOW LABOR COSTS




## MECHANIZE WITH A BARCO

Hard-working track superintendents will tell you that Barco Unit Tytampers can tackle and lick *more* track jobs per shift, keep down costs and conserve worker energy. Barco is a light, self-contained powerhouse that hits hard and fast under the heaviest going. Its biggest winter job is clearing interlocking switches and station platforms. Barco tamps ballast uniformly and firmly the full length of the tie, so that it is less subject to unequal compression by passing trains. Write Barco Manufacturing Company, 1805 Winnemac Avenue, Chicago 40, Ill. In Canada: The Holden Co., Ltd., Montreal, Canada.

**BARCO UNIT TYTAMPERS**

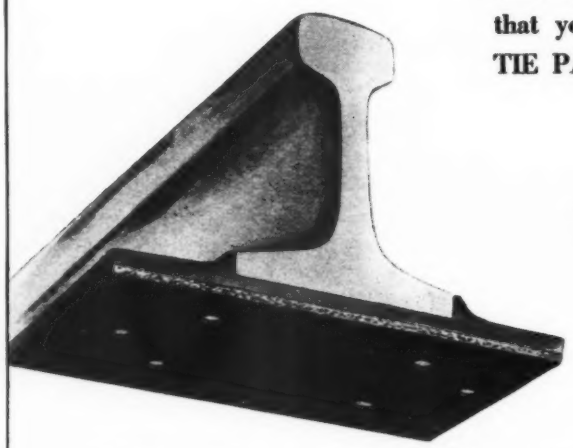
**FREE ENTERPRISE — THE CORNERSTONE OF AMERICAN PROSPERITY**

# FABCO TIE PADS

## *For Open Track*

**After seven years of intensive development we offer FABCO Tie Pads to reduce the mechanical wear of ties *on Open Track* . . . *and* at prices which make the first cost, as well as the last cost, a real economy to the railroads.**

**FABCO Tie Pads for Open Track are stocked for delivery in ¼" thickness in standard tie plate sizes 7¾" x 12"; 7¾" x 13"; 7¾" x 14"; with other sizes available on special order ... they withstand extremes of temperature, moisture, brine, mildew, and sand ... *and* their limited resiliency, without permanent set, means that spikes do not have to be driven down a second and third time. Many other advantages make it important that you GET ALL THE FACTS ABOUT FABCO TIE PADS — Today!**



*New Fabco Tie Pad*

*For Open Track*

- **Prevents Cutting of Ties**
- **Resilient—no set—no loose spikes**
- **Long Life—no renewals required**

*"Fabco Tie Pads" Made By The Makers of Fabreeka*

## FABREEKA PRODUCTS COMPANY

**Incorporated**

**222M Summer Street • Boston 10, Massachusetts**

A powerful magnet and smooth operation provide fast handling with complete safety.

With slings the crane can raise and carry huge loads of rails, boiler tubes, pipe, sheets and any other bulky material. Note the clamshell bucket, available for moving ballast, cinders, coal and similar materials.

The LS-90 magnet crane is "built to order" for rapid handling of small parts such as tie plates and miscellaneous scrap.

# *They Handle Anything*

**WITH THEIR**

**LINK-BELT SPEEDER**

## "OFF-THE-TRACK" LS-90 CRAWLER CRANE GOES ANYWHERE—ANYTIME—*DOES MANY JOBS!*

In the Pueblo yard of the D. & R. G. this Link-Belt Speeder LS-90 Crane literally goes anywhere. Being crawler mounted it needs no track and never interferes with other equipment which must use the rails.

With sling, magnet or clamshell bucket it will hoist, stack, load, unload and transport anything from sand up to structural steel, sheets, rails and pipe.

Superintendent, foreman and chief engineer are in agreement that this Link-Belt Speeder is doing a swell job, with greater convenience and at a saving of much time, compared to former methods.

10,782

Link-Belt Speeder shovel-cranes, from ⅜ yard to 3 yard capacity, crawler or wheel mounted, offer a type and size to meet any requirement, for yard, stores, repair shop or line construction and maintenance. There is a distributor near you, ready and equipped to give you prompt, courteous sales and service.

**LINK-BELT SPEEDER**

LINK-BELT SPEEDER CORPORATION
A DIVISION OF LINK-BELT COMPANY
CEDAR RAPIDS IOWA

*Builders of the Most Complete Line of*
**SHOVELS-CRANES-DRAGLINES**

No. 230 of a Series

Railway
Engineering and Maintenance
SIMMONS-BOARDMAN PUBLISHING CORPORATION

105 WEST ADAMS ST.
CHICAGO 3, ILL.

Subject: Exhibits Don't "Just Happen"

Dear Readers: February 1, 1948

I wonder if you, as railway engineering and maintenance officers, realize how fortunate you are in the exhibits of power tools, machines and materials that are put on from time to time by railway supply companies in connection with the annual conventions of your more important national associations. I think of this as we go to press with this issue and include a page telling you of the plans of the National Railway Appliances Association for its exhibit, March 15-18, at the International Amphitheatre, Chicago, in connection with the annual meeting of the American Railway Engineering Association.

Many of you have attended N.R.A.A. exhibits in the past and know what they're like—a well-organized display of the products of some 100 or more manufacturers, who spend all or most of their time endeavoring to produce exactly what you want to facilitate, improve and reduce the cost of your work, and trying to get for you what you want when you want it. There they are—booth after booth of these products, for you to examine and handle, and, in many cases, operate if you desire. And invariably these booths are attended by one or more sales representatives and service engineers, who are ready to answer any questions you may want to ask. That there is an N.R.A.A. is, indeed, fortunate for the railways and for all of you who can attend its exhibits.

Undoubtedly, most of you feel the same way about these exhibits; you are impressed and enlightened every time you attend one, and invariably come away with new ideas as to how you can do your work better, faster and at a lower cost. But I wonder if too often some of you don't have the idea that these shows "just happen"; that "presto", and the exhibit is on, and with this in mind, or with no thought at all about the matter, appreciate the exhibits less than you should.

Reflect for just a moment, if you will, on the number of companies, number of railway supply men, and tons of equipment and materials involved, and think of the crating, transportation, and set-up and knock-down labor required in putting on one of these exhibits. Only by so doing can you appreciate fully what is involved from the supply companies' standpoint in making these exhibits available to you.

Having dealt with the various officers of the N.R.A.A. over many years on a wide range of matters, I know how seriously they take the planning and presentation of these shows. And the present officers are certainly no exception. From repeated conversations with a number of them I know that they are sparing no effort to make this year's exhibit the finest possible.

May I suggest that you keep this in mind as you plan to attend the exhibit in March. If you do, I am sure it will give you a greater appreciation of what has been provided for your benefit—and you may, consciously or unconsciously, get a lot more out of the exhibit.

Sincerely,

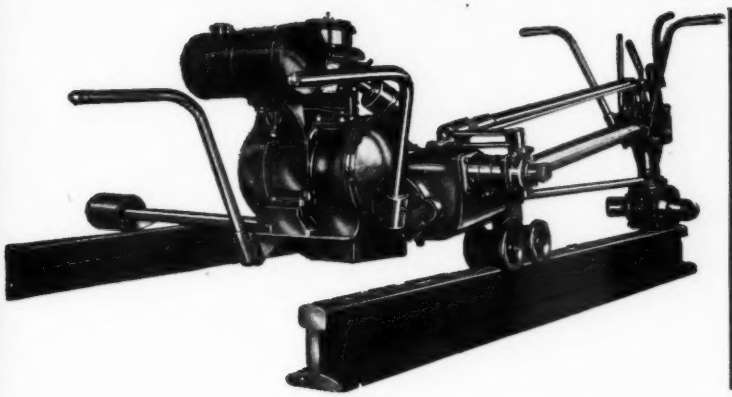
Neal D. Howard

NDH:jb

Editor

MEMBERS: AUDIT BUREAU OF CIRCULATIONS AND ASSOCIATED BUSINESS PAPERS, INC.

# Raco Power Track Wrench



Be sure to see our exhibit, Booth 79, Amphitheatre, Chicago, March 15th to 18th.

The Raco Wrench sectioned to demonstrate design and quality.

Superior design and quality construction keeps the Raco Wrench on the job and out of the shop.

Great power and toughness in light weight.

Six horse power engine.

Its steady and insistent power either backs off rusted nuts or breaks the bolts.

With Raco some roads finish the initial tightening in high speed.

The Raco Micro Cutout is uncanny in its accuracy. Its graduated scale is a great convenience and insures uniform torque at any predetermined setting.

In an emergency one man can take a Raco Wrench off the track without smashing it. Two men can handle it on and off rails. It is an easy 3-man carry.

Speed and facility of operation result from many carefully thought out details of design and construction.

Remarkable for its long life, the Raco chuck has been further improved so that it will go on and off nuts instantly in high speed.

The Raco Wrench stops at the nut without drift and starts to roll with minimum push.

It has complete, convenient and easily operated controls.

The operator works at a sufficient distance from the engine fumes.

The operator works in an erect position and has very little bending to do.

The Raco is practically noiseless in operation.

Its operating head has floating balance and can be swung and presented to nut with effortless ease.

Its chuck head is designed so that chucks are exactly aligned with nuts, either side of rail.

On the basis of work produced per man per day the Raco Wrench is most outstanding.

RAILROAD ACCESSORIES CORPORATION

CHRYSLER BUILDING · NEW YORK 17, N.Y.

# *Firm Footing Means Safe Operation*

Uniform firmness of the roadbed is a decided advantage in promoting safer train operation. The Fairmont Grouting Outfit supplies an economical and efficient means of obtaining the desired uniformity by eliminating water pockets and soft spots. In addition, it is highly portable and well adapted to any grouting program. Fairmont invites your inquiry for complete information. Fairmont Railway Motors, Inc., Fairmont, Minnesota.

**Fairmont**

**RAILWAY MOTOR CARS AND WORK EQUIPMENT**

*World Wide Distribution*

*Performance* ON THE JOB COUNTS

INSPECTION, SECTION AND GANG CARS • MOTOR CAR ACCESSORIES • PUSH CARS • TRAILERS • WHEELS, AXLES AND ROLLER BEARINGS • ENGINES • DERRICK CARS • WEED BURNERS • WEED MOWERS • WEED SPRAYERS BALLAST DISCERS, SCARIFIERS, BLADERS • EXTINGUISHER CARS • OIL SPRAY CARS • SPOT BOARDS • GROUTING OUTFITS

# Railway Engineering and Maintenance

NAME REGISTERED U. S. PATENT OFFICE

FEBRUARY, 1948



**Editorials** - - -

# A CONVENIENT *Source of Supply*

## FOR YOUR FROGS, SWITCHES AND CROSSINGS

*America's Most Complete Line of Track Specialties*

- DEPTH HARDENED MANGANESE STEEL CROSSINGS
- MANGANESE STEEL GUARD RAILS
- VERTICAL SWITCH RODS
- AUTOMATIC SWITCH STANDS
- SAMSON SWITCH POINTS
- RAIL AND FLANGE LUBRICATORS

RACOR

Ramapo's facilities, strategically located from coast to coast, are ready to serve the needs of America's railroads.

To help better serve the needs of the railroad industry, American Brake Shoe's modern research laboratories ★ are constantly used by Ramapo Ajax Division for the development, test and analysis of materials and devices. Here a continuous study against the forces of wear, impact and strain is conducted with the aim of producing and offering America's railroads the best material and equipment for the specific job. Any of the plants ★ (all have sales offices) or sales offices ● nearest you, shown in the map above, are ready to serve and help you with any of your trackwork problems.

American Brake Shoe COMPANY

***"Use RACOR Special Trackwork where stress and wear are greatest"***

# RAMAPO AJAX DIVISION

332 So. Michigan Ave., Chicago 4, Illinois

*ONLY RAMAPO HAS PLANTS FROM COAST TO COAST TO EXPEDITE AMERICA'S RAILROAD NEEDS*

NEW YORK, N. Y. • HILLBURN, N. Y. • NIAGARA FALLS, N. Y. • WASHINGTON, D. C. • ST. LOUIS, MO. • EAST ST. LOUIS, ILL. • SUPERIOR, WIS. DENVER, COLO. • PUEBLO, COLO. • LOS ANGELES, CALIF. • HOUSTON, TEXAS • SEATTLE, WASHINGTON, • CLEVELAND, OHIO

CANADIAN RAMAPO IRON WORKS, LTD., NIAGARA FALLS, ONT.

Railway Engineering and Maintenance

# *Good Will—*

## Railways Have It, But Must Fight to Hold It

The American railways have much to be thankful for as they face the months ahead. One of the things for which they can be most grateful is that, unlike the British railways, which became state property on January 1, they are less threatened at the moment by nationalization than for many years in the past. Furthermore, despite their acknowledged shortcomings, in large measure due to conditions beyond their control, they are basking in a relatively high degree of official and public esteem.

There are many reasons for this healthy situation, some entirely foreign to the railroads themselves, but some for which they can take full credit. Unquestionably, the most important factor is contained in the plain common sense and understanding of the overwhelming majority of the American people, who, amazed, if not appalled, by the unsettled, and even chaotic, political, economic and social conditions under totalitarian and socialistic governments in Europe, want no part of it in exchange for the "American Way" of free enterprise.

Furthermore, the American people have been amazed by the outstanding war record of the railroads under private management, have not forgotten the eulogies heaped upon the roads by the armed forces and government and private agencies for the accomplishment of an "impossible task," and have been told that while all this was going on, the railroads, under private management, contributed $3 million daily to government in taxes, without increased freight rates, whereas government operation of the railways during World War I cost the taxpayers $2 million daily, despite substantial freight rate increases.

More recently, the public has been equally impressed with the performance of the privately owned and managed roads since the war. They have come to appreciate that, despite shortages of cars and many other basic needs, the roads in 1947 moved more carloads of freight than they did when war traffic was at its peak; that they handled more coal than at any time in history; and that they moved the country's biggest wheat crop successfully, allaying widespread fears that the weather would destroy much of the grain before cars could be found to take it to cover. And they might have been told, if not already informed, that while these service records were being achieved, the railroads were building up new records of performance as measured by almost every index of operating efficiency.

Truly, the railways—at the moment—are in an enviable position of general public favor. But it should be a carefully guarded position, to be certain that it is not lost. It has been said, as pointed out recently by Daniel P. Loomis, executive director of the Association of Western Railways, that the United States follows Great Britain in many things economic and political by about twenty years. Whether there is any basis for this statement or not, it cannot be denied that "it could happen here" if the railroads lose public confidence or are forced into a state of inadequacy by unwise regulation and rate control.

Fear of the latter is lessened by the two recent interim freight rate increases authorized by the Interstate Commerce Commission to help offset higher labor and material costs, which indicates that the commission is aware of the needs of the railways for revenues adequate to attract to them the additional capital they will need to keep their facilities abreast of traffic demands. But the rate increases so far are still insufficient—amounting to an overall average of only 30 per cent since 1939, including the two interim increases, compared with arise of 70

per cent in wages and of 88 per cent in the cost of materials.

So there is still a two-fold job to be done to insure the continuance of the "American Way" for the railroads—and for all of their employees—in the years ahead. One, for the railroads themselves—by every means at their command—is to retain and enhance the present public good will toward them, and the other, for the I.C.C., is to see that the railroads are permitted adequate earnings under good management. Fortunately, there is reason to believe that both jobs will be done in a satisfactory manner.

# Ballast Cleaning—

## Machines Producing Revolutionary Changes

A QUESTION of whether it is desirable or essential to clean the ballast in the cribs along with that in the shoulders is one that has occupied the minds of track maintenance men for a number of years. To some extent it now appears that the issues involved were rather closely related to the availability, or non-availability, of mechanized equipment for assisting in the work.

To bring the subject into proper focus it might be worthwhile to refer back to an earlier stage of development when the question was whether to clean the ballast in the track shoulders. Prior to the development of mechanized equipment for performing this task the railroads had their choice of doing it by hand labor with forks or of renewing the ballast altogether. Since both alternatives were costly it happened more often than otherwise that the ballast became badly fouled and stayed that way for long periods. The advent of machines for cleaning shoulder ballast brought about a fundamental change in this situation; the practice became widespread of cleaning the ballast in the shoulders at relatively frequent intervals, thereby producing substantial benefits.

The question then arose regarding the desirability or necessity of cleaning the ballast in the cribs. A large school of thought held that the cleaning of the shoulder ballast was sufficient and that, when this was done, it was not necessary to touch the ballast in the cribs. The reasoning was that the foreign material in the shoulders holds the water in the ballast and that, when this material was removed, free drainage was again established, regardless of dirt in the cribs.

A smaller school of thought held that clean crib ballast was an essential concomitant of economical track maintenance, and it is significant that one road belonging to this school, which was willing to back up its reasoning with the policy of cleaning the crib ballast, acquired the reputation, among some observers, of having the best ballast condition in the country.

A number of machines and devices have now become available that have greatly reduced the cost of cleaning the crib ballast. A parallel—and significant—development has been a change in the thinking of some track men regarding the question of cleaning the ballast in the cribs, with the result that an increasingly large number of railroads are adopting this practice.

The point is that mechanization not only is a revolution in itself, but that it can also bring about a revolution of thought, and that maintenance men must keep abreast of such changes in thinking if they wish to take full advantage of new developments.

# New Machines—

## Success Depends on Gang Organization

WHERE machines are made available for performing maintenance work there still remains the problem of assuring that they are used in such a manner as to take advantage of their maximum potentialities. In fact, it is not too much to say that this is at least half the problem involved in mechanization; where a machine is used with anything less than maximum efficiency money is being wasted just as if it were scattered along the track.

There are many aspects to this problem, but in this discussion we are concerned with only one of them—the organization of gangs to assure that any machines used by them will not be delayed, and forced to remain idle, while waiting for other phases of the work to catch up. Such waste of machine-time and man-hours cannot be avoided altogether, but it can be minimized by careful study with the idea of organizing the gang so that all operations are brought into balance with each other.

On most roads the gang organizations for the major track maintenance operations have been brought to a high state of efficiency as a result of study and experience over the years. However, since most maintenance gangs are organized around the equipment used, it is obvious that any changes in the machines or the addition of new ones will necessitate corresponding alterations in the organization if the best results are to be realized. Yet instances have occurred where the reorganization of gangs has been inadequate or even neglected entirely.

The adverse results of such failures may manifest themselves in several ways. In the first place the full potentialities of the new or improved equipment will not be realized. More serious, however, is the fact that the failure of a machine, through no fault of its own, to measure up to the expectations held out for it, may give it an unwarranted "black eye" that may not easily be overcome, thereby possibly depriving the railroad of the benefits of a valuable piece of equipment.

Every railroad should require, when a new or improved machine of any size or importance is placed in service, that the organization of the gang using that machine be subjected to a searching analysis and any adjustments made that may be found necessary in the interest of maximum efficiency. Only in this way can the full return on the investment be realized.

# Good Yard Maintenance *Essential* to *Efficient* Operation

**Based on an address presented before a recent meeting of the Maintenance of Way Club of Chicago, this article is essentially a plea for high standards of maintenance and construction in yards. Mr. Rice first discusses the operating aspects of the problem, pointing out that good maintenance in yards is a prerequisite of efficient operation, and then tells what constitutes the high standards necessary to such operation.**

By W. T. RICE
Superintendent
Richmond, Fredricksburg & Potomac,
Potomac Yard, Alexandria, Va.

THE MAINTENANCE officer can serve his company best if he spends wisely the funds that are available for labor and materials. He can help reduce the operating ratio by keeping the tracks and structures maintained in accordance with the demands of modern operation. This applies in yards as well as on the main line. Accordingly, the question may well be raised whether the demands of yard maintenance have changed in recent years, and whether our old practices of employing small track gangs in yards, and of using worn-out material from the main line, are practical and economical today. These questions can be answered correctly only in the light of a careful cost analysis of the yard and terminal involved.

In recent years the railroads have spent millions of dollars for heavier and more powerful locomotives, better equipment and tracks, and intricate signal systems to move freight faster from terminal to terminal. Yet, all too often the advantage in time saved on the road is lost in our yards, where long delays are suffered due to poorly maintained and inadequate facilities. The impetus of fast freight must be continuous from receiving yard to dispatching yard.

We tell the shipping public of our fast freight service, and we must produce this service if we are to keep the business on the rails. We must not forget that the trucks and boats are back—that we again have competition. Fast freight train schedules require yards that are well maintained and with adequate facilities to facilitate the prompt and safe classification and dispatchment of trains.

I recently heard an executive of one of our large railroads say, "The running time of our freight trains is splendid, but the standing time in yards is terrible." We, as maintenance men, must provide the facilities to help decrease this yard standing time.

A typical example of the need for good yard maintenance is seen in the movement of the perishable traffic from the southern states of Florida, Georgia and the Carolinas to the Middle Atlantic and New England states. This traffic is on a third-morning delivery schedule in New York—which allows no time for yard delays. Several trains are received daily at our Potomac yard (Alexandria, Va.) with cars, originating on two railroads, that have not been iced since leaving their initial terminals. These cars must be re-iced, inspected for interchange, classified to move out in destination blocks over two other railroads, assembled into outbound trains and dispatched—all in four hours. If a tie-up occurs due to poor track conditions, many of these cars will miss their scheduled connections and will not be placed for unloading in New York until the fourth morning. As a result we must pay the difference in the market value of the produce if the market drops — and it usually drops if cars are delayed. I have seen claims on delayed traffic run as high as $300 per car.

**"Stone Ballast Is Economical on Busy Humps and to Support the Hump Ends of Receiving and Classification Yards." Shown at the Right Is a Stone-Ballasted Hump at Potomac Yard**

Adequate Floodlighting, Supplemented by Sodium-Vapor Lamps, Is of Great Value in Night Operations at Potomac Yard

Today the railway officer must look at the overall picture in computing the cost of yard maintenance. He must consider not only the actual cost of constructing and maintaining yard facilities, but also the cost of *not* providing the service advertised by our traffic departments. In our advertising campaigns, there is no equal for a satisfied shipper.

Good maintenance and modern yard facilities are economical. We have found that stone ballast is economical on busy humps and to support the switches at the hump ends of receiving and classification yards. The original grade laid out over the hump represents the ideal condition for any yard, and any uneven surface that develops will show up in the way cars stop on the leads or fail to clear in the classification tracks. Well-tamped, stone-ballasted track adjacent to retarders will reduce the need of trimmer engines. No hump operation, no matter how well it is planned, can be fully satisfactory unless the cars roll at uniform speed into the classification tracks after leaving the retarders.

Heavy rails in heavy-traffic areas—such as over humps and through important switches—will save track labor and expedite traffic. The idea that we can get by with light, worn-out rail in a busy yard is costly. All interruptions to movement are expensive because they delay traffic and cause unproductive train and engine-crew time.

The installation in heavily-used yard tracks of badly-worn frog and switch material from the main line is often false economy. The use of worn rail for stock rails with new switch points has ruined many a good switch. The cost of frequent installations often offsets all the savings that may be gained through the use of worn frog and switch material in busy yard tracks.

Sharp turnouts are expensive to maintain and difficult to operate over. The operating people hate a restricting switch or curve. Frequently a six-foot rule and a piece of string will help solve the problem of reducing curvature and adjusting alinement.

Permanent grade stakes for yard tracks will permit the necessary refinement needed where cars are moving by gravity. These stakes should be located on hump grades so the foreman can check the grade frequently, and thus assist the operating department in preventing heavy car impacts in the classification yard.

At one time we had difficulty in getting cars to roll in the clear on the outside tracks of our 48-track northbound classification yard. It was often necessary to have a trackman oil the outside rails on the curves leading into these tracks. Later, a rail-flange lubricator was installed on the hump and the trouble was corrected. The prolonged life of switches and rail resulting will soon pay for the lubricator.

Sodium vapor lights are quite valuable at retarder locations in areas where heavy fogs occur. At Potomac yard — which is located along the Potomac river—heavy fogs are common in the fall and spring. The retarder operators tell me that sodium vapor lights, so located that cars must pass between them and the lights while entering the retarders, are very helpful in determining the location and estimating the speed of cars.

Adequate floodlights are of the utmost value in increasing the production of yard night forces. Furthermore, in a well-illuminated yard there is little security difficulty and personal injuries are reduced. We installed a very extensive system of floodlights in our southbound classification yard and favorable results were noted immediately.

### Need for Good Drainage

More emphasis is being placed on yard drainage than ever before. Engineering forces should always consider any drainage problems present and work out the best solution. Yards that are properly drained will cost less to maintain, and the efficiency of employes will be increased. No one likes to walk through water, and ice presents a serious hazard. Good drainage is particularly desirable in enginehouse territory where much water is wasted and many employees are working.

The yard track foreman must be of the highest caliber. He does more switch work, handles more kinds of

materials, and must perform more types of services than any other foreman in the maintenance of way department. He must be able to lay out and build a first-class switch, install a retarder, be an expert in wrecking, keep accurate records of materials, and, at the same time, know how to get a cow up that is down in a stock car. The modern yard is no place for the second-rate foreman. His ability and ingenuity in carrying out his daily tasks. can save many dollars for his company.

### Adequate Gangs Necessary

The track gangs must be of sufficient size to perform the work without delay to the operating department. Busy tracks cannot be released for indefinite periods while an inadequate gang struggles to complete renewals or repairs. It is better to have sufficient forces in the yard to do preventive maintenance than to have to renew ties or correct the gage in the middle of the night after an engine has found the weakest spot in a piece of track at greater cost.

All planned renewals or changes should be worked out jointly with the operating department. Through such co-operation the needs of the operating people can be met and frequently the cost of doing maintenance work can be reduced. Such factors as off-season traffic, hours when tracks can best be put out of service, and additional power that will permit greater use of the track by the maintenance forces should be considered with the local operating officers well in advance of each job. Getting the desired attention may require a little pressure from "upstairs" at times, but it will save dollars for the railroad. Time claims from operating unions can be reduced while certain work is going on if the operating supervisors are consulted in advance and their more detailed knowledge of the working agreements applicable to their department is utilized.

### How Cooperation Pays

When we renewed a retarder and adjacent switches at Potomac yard recently, the maintenance and operating forces jointly figured out the day and hours when this section of the yard could best be out of service As a result, with no delays to traffic, the tracks were taken out of service for ten hours and the entire job was completed. In a like manner we renewed all of the switches next to the hump in our northbound receiving yard. The maintenance forces planned the job weeks in advance with our operating people and full information was published to the yardmaster, conductors and trainmen as to the work to be done. Again, a big job was carried to completion without disrupting the operation of the yard.

The maintenance forces seldom see the files on claims resulting from delayed or damaged freight. A yard tie-up due to spread track, a worn switch point or excessive curvature is usually regarded by the maintenance man in terms of what it costs in labor and material to clear up the trouble. The real cost, however, frequently lies in the claims that must ultimately be paid due to delayed or damaged freight—claims which might be avoided, if the "ounce of prevention" adage is applied.

The delay suffered by individual cars in a yard tie-up is not all that is involved in such a tie-up. The operating department usually keeps crews down to the minimum, and when one of these crews is involved in a derailment or in handling a wrecked train, other yard moves must suffer or additional power must be put in service.

### Wrecking Work Expensive

The high wage level of all classes of employees makes wrecking during the night a very expensive operation, for which nothing constructive is gained by the road. Furthermore, a track gang that has been troubleshooting all night has little value as a maintenance gang the next day. Added to these tangible costs are the intangible costs which may be attributed to lost business resulting from poor service.

### Housekeeping Helps

A little "eyewash" is good as a morale builder and encourages employees to take pride in the appearance of their yard. The prompt removal of scrap and worn-out track materials upon completion of a job will remove many tripping hazards and other causes of personal injuries. Personal injuries are expensive both in man-hours and dollars; therefore, remove the causes of them before injuries occur. Provide empty barrels for trash on humps and at other locations where employees gather. Employees will soon learn to use them and the appearance of the yard will improve.

You may well ask, "Where will we get the money for the labor and materials to maintain our yards in such a manner?" In some cases we are penny-wise and dollar-foolish in our yard maintenance. We must establish a higher goal and approach that goal as closely as possible. In the light of the necessities of modern operation, we must consider the overall picture. We can't afford *not* to have a high standard of maintenance in our yards where traffic demands such maintenance.

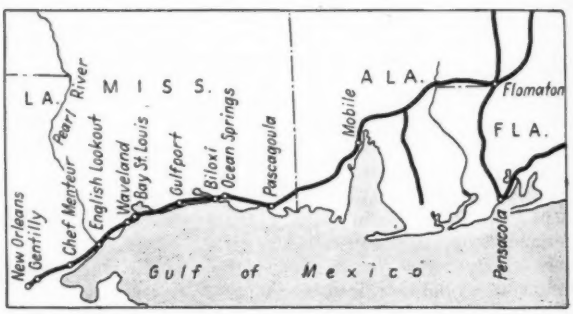
Snow-Fighting Forces on the Boston & Maine Are Aided in Their Work by this Snow Melter Which Scoops Up the Snow and Deposits It in a Tank Where It Is Melted by Steam

## Louisville & Nashville

# Fishes a Railroad Out of t

**The tropical hurricane which struck the Gulf Coast region last September caused property damage amounting to about $3,000,000 to the lines of the Louisville & Nashville. A 40-mi. stretch of track was almost entirely destroyed, as were several larger bridges. Speaking before the Maintenance of Way Club of Chicago on January 26, L. L. Adams, assistant chief engineer of the L. & N., described the extent of the damage and the measures that were taken to restore service on the affected line. This article is based on Mr. Adams' paper.**

Above—View of Damaged Track in Territory South of the Pearl River. Below—The Station at English Lookout, La., After the Storm




Map of the Mobile & New Orleans Division of the Louisville & Nashville, Which was Heavily Damaged by the Hurricane

# of the Marsh

ON September 19, 1947, "Emma", the name given by army weather forecasters to a tropical disturbance of major proportions which, two days earlier, had struck at southern Florida, and then moved across the Gulf of Mexico in a northwest direction, struck the Mississippi and Louisiana Gulf Coast area with terrific force. Torrential rains accompanied the hurricane, and waves from the Gulf, driven by the high winds, swept into the numerous bays and inlets and across the coastal lowlands to add to the destruction.

The Mobile & New Orleans division of the Louisville & Nashville, which follows the shore line closely for much of the distance between Mobile and New Orleans, was severely damaged by the storm. Since 1881, portions of this line have been out of service on seven occasions because of damage from tropical hurricanes. These various interruptions in service were from 4 to 26 days in length. The hurricane of September 19 was far more destructive than any previous storm and did about $3,000,000 damage to the properties of the L. & N.

Based on previous experience, the L. & N. began making preparations to cope with storm damage as soon as it became evident that "Emma" would strike the Gulf coast. Two bridge gangs and two extra track gangs, together with a Burro crane, a steam crane, and a pile driver, were moved to the south end of the division so as to be in a position for reconstruction work at that end. Other bridge gangs and extra gangs, together with material and equipment, were moved as far south as safety would permit. As a result of this preparation, reconstruction work on the south end of the division was started almost as soon as the storm abated. Still other gangs from more remote points on the L. & N. arrived in Gulfport, Miss., via the Gulf, Mobile & Ohio and the Illinois Central, and started repair work on the second day after the storm.

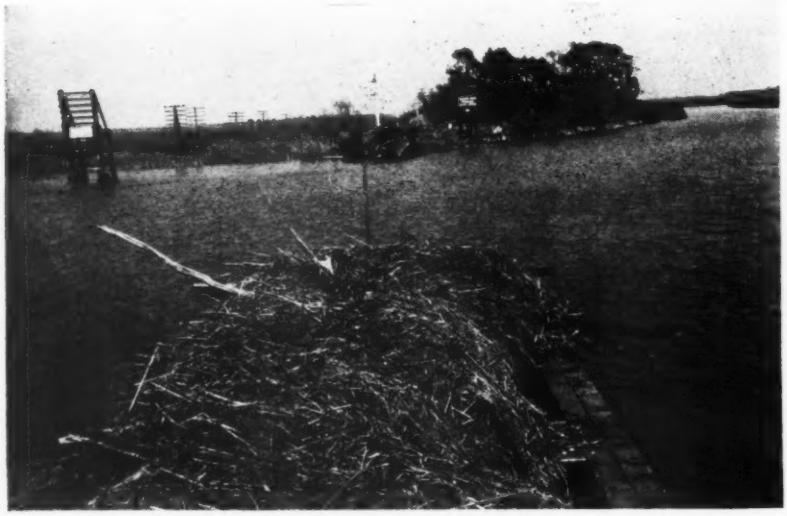
A survey after the storm revealed that the damage was most severe between Waveland, Miss., 88 mi. south of Mobile, and Gentilly, La., a distance of about 40 mi. The track in this territory was almost completely destroyed. The damage was caused

Only 38 of the 384 Panels in the Pile Trestle Over Biloxi Bay Were Intact After the Storm

Above—Bulldozers and Cranes Prepared the Roadbed and Tractors Pulled the Track into Position. Below—At Some Locations the Roadbed Was Scoured to Depths of 1 to 7 ft.

almost entirely by high water driven by the storm, which covered the track with swamp grass and other debris to depths of 2 to 5 ft. at many points. In some locations ballast washed out from around the ties but the track remained in place, while in other instances the track was washed 20 to 100 ft. off the roadbed, and the long stretches of the roadbed itself scoured out to depths of 1 to 7 ft.

Bridges and trestles in the area were also damaged considerably by the storm. The most heavily damaged was the Pearl River bridge, consisting of nine deck-girder spans supported on wood pile piers, and one horizontal swing span, which, together with approach trestles, totalled 897 ft. in length. Seven of the deck girder spans and their piers were washed away. The deck of one of the remaining girder spans was missing and the remainder of the bridge was covered with debris.



**Seven out of Nine Deck-Girder Spans in the Pearl River Bridge Were Washed Away and Lost**

Other structures severely damaged were those over Biloxi bay and Bay St. Louis, 60 mi. and 88 mi., respectively, south of Mobile. The former structure, consisting of 384 panels of pile trestle and a 220-ft. swing span, was damaged to the extent that only 38 panels of the trestle remained intact and in good line. In 91 additional panels the deck was intact but had been shifted on the caps of the bents. Two hundred fifty-five panels of the deck were washed into the bay. One section of the deck, 1,874 ft. long, was found—with the stringers, ties, rails and guard rails still fastened together—lying across an island more than three miles from the bridge.

In the case of the Bay St. Louis bridge, which consisted of 646 panels of trestle and a 191-ft. 6-in. swing span, damage was similar to that done to the Biloxi Bay bridge. Here, 142 panels remained intact and in good line, while 84 were shifted on the caps. Of the remainder, 420 panels of decking were gone and the bents were stripped to the caps. Portions of the deck were located as many as five miles away from the bridge.

In addition to the damage to the track, roadbed, and structures, extensive damage occurred to the signal and communications facilities. A large number of telephone and telegraph poles and signal masts were uprooted and overturned, as were numerous battery wells and relay cases. One interlocking was destroyed and the automatic signal system and the train-stop system were put out of order.

### Reconstruction

Reconstruction of the damaged track was seriously handicapped by the fact that much of this track was isolated by the damaged bridges. Repair of the structures was, however, made somewhat easier by the fact that most of them were readily accessible to floating equipment, so that work could be progressed at all points simultaneously.

Bulldozers and crawler cranes were used to repair the roadbed and tractors were used to return the track to its original location whenever possible. Because the material in the marshes was not suitable for restoring the embankments, it was necessary to establish the grade of the rebuilt track 2 to 4 ft. below the original surface in order to restore service as quickly as possible. Later the tracks were raised on ballast to the proper elevation.

Company-owned off-track equipment was rushed to the scene from all points of the L. & N. and, in addition, a large amount of equipment was rented from local contractors. Where possible, the equipment was moved in over highways, but in the territory between the Pearl river and Chef Menteur, La., a former navy L.C.T. was used in "landing operations" to bring the equipment to the isolated sections of the line. Small boats were used to transport men working on these sections.

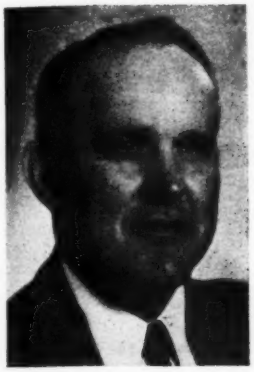
Reconstruction of the larger bridges was delayed considerably by the inability to purchase new timber in sufficient quantity, and it was necessary to salvage as much of the original material as possible. This was done by dismantling the decking wherever it could be located and hauling the timbers to the bridge sites. In some instances the decking was floated intact back to the sites and then dismantled and replaced in position.

A pile trestle was constructed to replace the seven missing girder spans of the Pearl River bridge. This proved a difficult undertaking because of the swift current in the stream at this point and because of the depth of the water, which is as much as 56 ft.

In spite of the many handicaps presented, the maintenance forces made rapid progress in restoring the line to service. Because of the difficulties already mentioned, the Pearl River bridge was the last to be completed, a work train being permitted to pass over it on October 22, one month and three days after the disaster. Thereafter, the work of reconstructing the track progressed rapidly and the line was reopened on October 24.

Restoration of the Mobile & New Orleans division of the L. & N. was carried out under the general direction of C. H. Blackman, chief engineer, L. L. Adams, assistant chief engineer, and Edward Wise, Jr., engineer maintenance of way, all with headquarters in Louisville, Ky. W. O. Benfield and J. D. Vaughn, supervisors at Mobile, Ala., and Bay St. Louis, Miss., respectively, were in direct charge of the track reconstruction, while the reconstruction of the bridges was directed by J. C. Nichols, bridge engineer, L. Charles Soard, general bridge inspector and J. M. Salmon, Jr., assistant general bridge inspector, all with headquarters at Louisville, and by J. A. Carpenter, supervisor bridges and buildings and J. P. Bolling, assistant supervisor bridges and buildings, both of Mobile. The reconstruction of the bridge over the Pearl river was directed by H. C. Forman, special engineer, Louisville.

# Suppliers Plan Record Exhibit During A.R.E.A. Meeting



R. B. Fisher
*Secretary, N.R.A.A.*

**Comprehensive products display of the National Railway Appliances Association to be held at International Amphitheatre on March 15-18. Board of directors elects R. B. Fisher secretary to succeed the late Charles H. White**

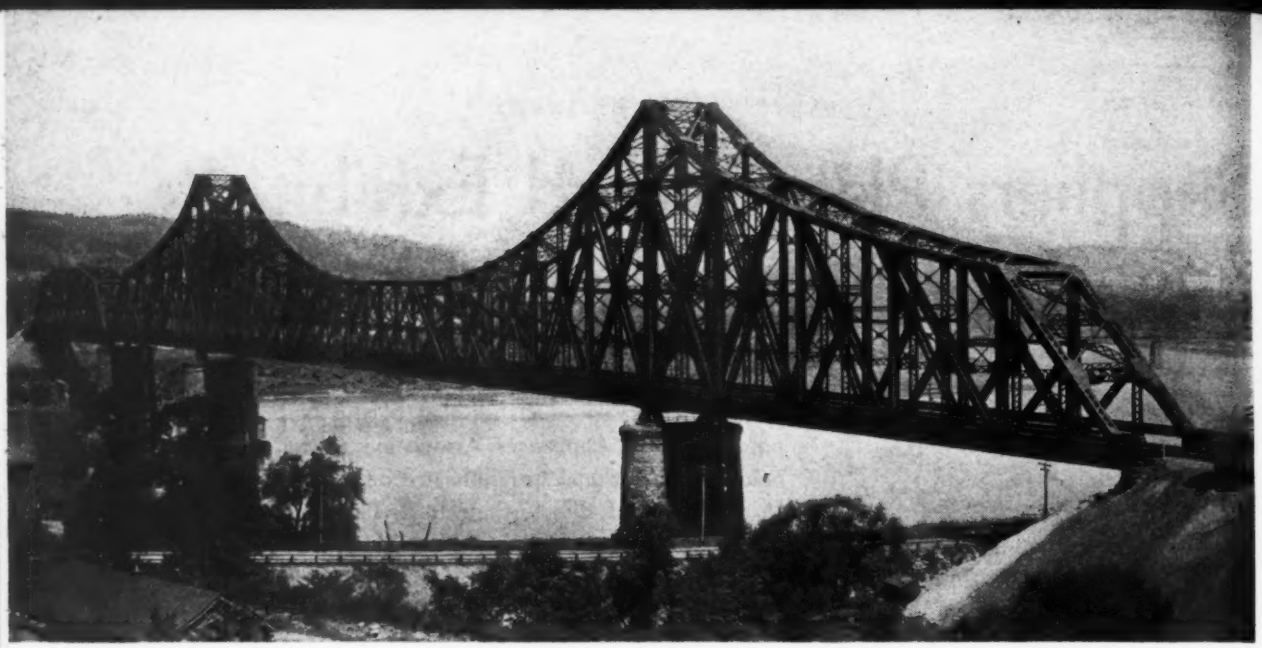
TO A greater extent than ever before it is imperative that engineering and maintenance officers have a complete knowledge of the equipment, devices and materials available for use in the construction and maintenance of the railways' fixed properties. An opportunity to obtain such knowledge first hand—that is, by direct examination of the products themselves—will shortly be available in the form of a comprehensive exhibit which the National Railway Appliances Association is planning in the International Amphitheatre at Chicago on March 15-18, in conjunction with the meeting of the American Railway Engineering Association.

Already 89 companies have arranged to be represented at the exhibit, thereby assuring that the display will be one of the largest—if not the largest—ever held by this association. The companies that have signed for space to date are listed below. For the convenience of railway men desiring to view the exhibit, free bus service will operate at intervals of 10 min. between the Palmer House (scene of the A. R. E. A. meeting) and the amphitheatre.

An unfortunate circumstance bearing on the exhibit was the untimely death on December 24 of Charles H. White, secretary of the N. R. A. A. Recovering from the shock of Mr. White's death, the association is going forward with plans for the exhibit. These plans are being directed by C. L. Mellor (Barco Manufacturing Company), as president of the N. R. A. A., and R. B. Fisher (Buda Company), who, at a recent meeting of the board of directors, was elected secretary of the association to fill the unexpired term of the late Mr. White. Mr. Fisher was also appointed director of exhibits and chairman of the association's Exhibit committee. New offices of the association have been established at 1 N. LaSalle Street, Chicago.

## Exhibitors

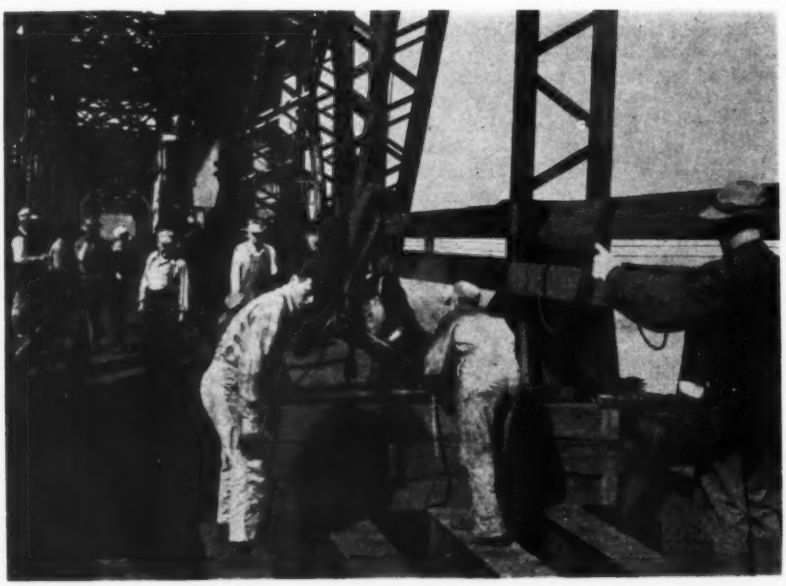
Achuff Railway Supply Company
Air Reduction Sales Company
Allied Chemical & Dye Corp.
American Fork & Hoe Co.
American Hoist & Derrick Co.
Armco Drainage & Metal Products, Inc.
Austin-Western Company
Barco Manufacturing Company
Bernuth, Lembcke Company, Inc.
The Buda Company
Caterpillar Tractor Company
Chicago Pneumatic Tool Company
Chipman Chemical Company, Inc.
Crerar, Adams & Co.
Cullen-Friestedt Company
Dearborn Chemical Company
Henry Disston & Sons, Inc.
The Duff-Norton Manufacturing Company
Eaton Manufacturing Company
Electric Tamper & Equipment Co.
Eutectic Welding Alloys Corporation
Fabreeka Products Company
Fairbanks, Morse & Co.
Fairmont Railway Motors, Inc.
Harnischfeger Corporation
Hayes Track Appliance Company
Hubbard & Co.
Independent Pneumatic Tool Company
Industrial Brownhoist Corporation
Ingersoll-Rand Company
Insley Manufacturing Corporation
International Harvester Company
Johns-Manville Sales Corporation
O. F. Jordan Company
The Joyce-Cridland Company
Kalamazoo Manufacturing Company
The Kershaw Company, Inc.
Koehring Company
The Lehon Company
LeRoi Company
Littleford Bros., Inc.
Maintenance Equipment Company
Mall Tool Company
The Master Builders Company
Mid-West Forging & Manufacturing Co.
Modern Railroads
Monroe Railway Appliance Company
Morden Frog & Crossing Works
Morrison Railway Supply Corporation
The Murdock Manufacturing & Supply Co.
National Aluminate Corporation
The National Lock Washer Company
The Nichols Engineering Company
Nordberg Manufacturing Company
The Oxweld Railroad Service Company
The P. & M. Co.
Pettibone Mulliken Corporation
Philadelphia Steel & Wire Corp.
Pittsburgh Pipe Cleaner Company
Power Ballaster division, Pullman-Standard Car Manufacturing Company
The Pocket List of Railroad Officials
Punch-Lok Company
Racine Tool & Machine Co.
The Rail Joint Company, Inc.
The Rails Company
Railroad Accessories Corporation
Railroad Equipment
Railroad Products Company
*Railway Engineering and Maintenance*
Railway Maintenance Corporation
Railway Maintenance Devices Company
Railway Purchases and Stores
Ramapo Ajax Division, American Brake Shoe Company
Reade Manufacturing Company
The Ric-Wil Company
Rust-Oleum Corporation
Schramm, Inc.
Sperry Products, Inc.
Taylor-Colquitt Company
Teleweld, Inc.
Templeton, Kenly & Co.
Thornley Railway Machine Company
Timber Engineering Company
Union Metal Manufacturing Company
United States Steel Corporation
The Warner & Swasey Co., Gradall division
Western Railway Supply Company
Woodings-Verona Tool Works
Woolery Machine Company



The Pittsburgh & Lake Erie's Ohio River Bridge at Beaver, Pa.

# Ties Renewed on Large Bridge in *Minimum Time*

**When it became necessary for The Pittsburgh & Lake Erie to renew the bridge ties on its four-track double-gauntlet bridge over the Ohio river at Beaver, Pa., it was decided to carry out the work by completely removing the rails from one gauntlet, or pair of tracks, and setting in the new ties rather than by jacking up the rails and inserting them from the side. That this method proved highly effective is indicated by the fact that the work was done in about half the time that was required at the time of the last complete renewal of the bridge ties in 1925. The methods employed and the equipment used to carry out this work are described in this article.**



**Below—After the Rails and Tie Plates Were Removed, the Old Ties Were Stacked and Removed to the Ends of the Bridge by Cranes and Placed in Piles Along the Shoulder**

CAREFUL planning, full preparation in advance and maximum use of power tools and equipment, together with the close cooperation of the operating department, enabled The Pittsburgh & Lake Erie to carry out the task of installing 3,454 new bridge ties on its four-track, double gauntlet, main-line bridge over the Ohio river at Beaver, Pa., in only 15 working days. In an earlier tie-renewal project on this bridge in 1925, in which a different method for doing the work was followed, 29 days were required to accomplish the same task.

### Description of Bridge

The Ohio River bridge of the P. & L.E., is located a short distance east of the station at Beaver, 26 mi. west of Pittsburgh, Pa., and is of the through-truss and cantilever type, 1,787 ft. long. The structure was erected in 1910. As already mentioned, it carries four main tracks, two eastward and two westward, each pair of tracks being on a gauntlet over the bridge. Two guard rails are provided in the center of each pair of tracks, these being 115-lb. Dudley rail, while the running rails on all four

tracks are of the 131-lb. RE section. The bridge is also used by freight and passenger trains of the Baltimore & Ohio, which has trackage rights for approximately 58 miles over the P. & L.E. between McKeesport, Pa., and New Castle Junction.

The floor system of the bridge embodies floorbeams at the panel points, and spanning between these there are nine rows of stringers, one of which is on the center line of the structure. These stringers are framed into the floorbeams in such a manner that the top flanges of the stringers are approximately six inches below those of the beams. The bridge ties, 8 in. by 10 in. in section, and 13 ft. long, are laid directly on the stringers with their inside ends resting on the center stringer. Wood spacing blocks are provided between the ties and additional shims, as necessary, are applied between the two end ties in each panel in order to lock the entire panel of ties securely in position.

### Ties Renewed in 1925

As already pointed out, the ties on this bridge were renewed in 1925. This was only 15 years after the bridge was placed in service. By contrast this second set of ties, which were treated, gave seven more years of service than the first set. The earlier renewal project was carried out by jacking up the rails of one pair of tracks, pulling the old ties out to the intertrack space and inserting the new ties. This procedure was continued across the bridge, first completing one pair of tracks and then the other. The new ties were brought up to the site of the work on hand trucks and the old ties were removed from the bridge in the same manner. No power equipment of any type was used. Seventeen days were required to renew the ties of the westbound tracks and 12 days for those of the eastbound tracks.

In 1947, after 22 years' service, it was found necessary to renew the ties again. Because of traffic conditions and other considerations, it was desirable to speed up the work as much as possible and complete it in minimum time. Of several plans considered, the one offering the best possibilities, considering all the requirements, called for taking one gauntlet, or pair of tracks, out of service during working hours and removing the running rails and guard rails from this pair of tracks, thereby permitting the old ties to be lifted directly out of position and the new ones to be installed in their places. Because of the double-gauntlet arrangement on the bridge, this would have the effect

**After the Old Ties Were Removed, Air Tools, Hand Hammers and Scrapers Were Used To Loosen Dirt and Scale from the Stringers. This Material Was Then Blown Off With Air**

**Above—Applying a Protective Coating of Hot Bituminous Compound to the Stringers After They Had Been Cleaned. Below—The Rail Crane Arrives With a Load of New Ties and Lowers Them Directly onto the Stringers for Subsequent Positioning by the Carpenters**

Tie-Boring Machines and Pneumatic Spike-Drivers Speeded the Track Reconstruction

of producing a single-track railroad across the bridge, but it was felt that this undesirable feature was more than offset by the increased speed with which the work could be done.

A four-track interlocking plant, known as "BG", is located directly east of the bridge and this plant, together with a similar installation at Beaver Falls, Pa., 3½ mi. to the west, known as "PO", afforded a means of routing traffic between these points over any of the four tracks. Train movements between these interlockings average 22 passenger trains and 28 tonnage freight trains daily in each direction.

### Detour Arrangements

It was decided that the ties under the two eastward tracks, No. 1 and No. 2, would be renewed first. This required all trains to use the westward pair of tracks over the bridge during working hours while this phase of the operation was carried out. However, an undesirable situation would have developed if both of the westward tracks were used in each direction between "BG" and "PO" interlocking plants. To avoid this, a temporary crossover was installed at the west end of the bridge, leading from Track 2 to Track 3 for eastward trains. By using this crossover, the movement of eastward trains against the current of traffic was, in effect, confined to the limits of the bridge.

The outside tracks of the P. & L.E.'s four-track system are used primarily for passenger trains, many of which are in suburban service, and the platforms at the passenger stations are constructed outside of these tracks. As indicated, the tie-renewal work on the eastward tracks required that all eastward trains, including the passenger trains, move over the eastward freight track between the Ohio River bridge and Beaver Falls. However, two passenger stations, namely Beaver and Beaver Falls-New Brighton, are located in this territory and temporary platforms were constructed at these stations so that passenger trains might be handled on the freight track during the time of the tie-renewal operations.

Other preliminary work, of course, involved the preframing of the bridge ties, which was done by railroad forces at the treating plant prior to the actual treatment. The ties were then brought to the site and stacked along the roadbed shoulder, being distributed equally at each end of the bridge. Three 4-in. by 4-in. by 10-in. spacing blocks were then spiked to each tie. Another preliminary step was the installation of a 2-in. pipe line the entire length of the bridge to convey compressed air for operating air tools. This line was connected to an air compressor located at the west end of the bridge.

### The Eastward Tracks

The work of renewing the ties on the eastward tracks was started on Monday, May 12, 1947. On that day the two guard rails were removed for the entire length of the bridge, using a power track wrench and a mechanical spike puller to speed this phase of the work. These rails were then picked up and left on work-train cars while the ties were being renewed. The tie-renewal operations were begun on the following day when the eastward tracks were put out of service at 8:00 a.m. and traffic was detoured as already outlined. Starting at the center of the bridge, and working toward each end, track forces removed the joint bars from the running rails and shifted the rails with bars to the intertrack space, beyond the ends of the ties to be renewed, together with the joint bars, tie plates and other fastenings.

### Cranes Handled Ties

As soon as the rails in the center panel of the bridge were removed, carpenter forces lifted the old ties out of position and stacked them in piles on the stringers. A locomotive crane and a rail crane, both self propelled, were used in handling the new and old ties to and from the bridge. These operated on one of the dead tracks, with one unit working each way from the break in the track at the center of the bridge. Each pile of ties was picked up in a cable sling by one of the cranes and removed from the bridge and unloaded on the ground. Ten ties were placed in each pile to be handled by the rail crane and 17 ties were placed in each of the stacks for the locomotive crane. A corresponding number of new ties were then picked up by the cranes and brought to the center of the bridge on the return trip. The loads of new ties were placed on the stringers for subsequent positioning by the carpenters.

### Worked Both Ways

As the cranes removed the piles of old ties from the bridge, additional rails were removed from the dead tracks, to permit more old ties to be piled for removal, the cranes always keeping within reach of the ties from the ends of track. Thus the work progressed both ways from the center of the structure in separate operations. This cycle of operation of the cranes was repeated until all of the old ties had been removed and all the new ones had been distributed.

Meanwhile, as the old ties were removed, two paint gangs of eight men each, one for each crane, loosened all dirt, corrosion, etc., on the tops of the stringers, using air tools, hand hammers and scrapers, and the loose material was blown off with air. After the tops of the stringers were cleaned, a hot application of bituminous coating was applied to the top surface and the new ties were then placed directly on this coating by the carpenter gangs.

As mentioned earlier, the stringers are framed into the floorbeams in such a manner that the tops of the stringers are approximately 6 in. below the tops of the floorbeams. This made it possible to hold the end ties in each panel squarely in position and, by the use of the 4-in. by 4-in. by

10-in. spacing blocks nailed to the ties, each tie in the panel was likewise held squarely in position. Before the last tie in each panel was inserted, a pair of jacks, working in unison, was used to take up all of the slack between the ties. The space to be filled by the last tie in the panel was then measured and, if necessary, one or more 1-in. shims were nailed to the inner side of the last tie before it was dropped into place, thus insuring a snug fit and that all of the ties would be held securely in place.

### Trains Detoured

During this phase of the renewal project, Tracks 1 and 2 were out of service from 8:00 a.m. to 5:00 p.m. A switch tender was stationed at the temporary crossover west of the bridge during working hours. Under the direction of the dispatcher, this man lined the crossover for eastward movements or restored it for normal westward movements as necessary. However, as both of these tracks were to be restored to service at the close of each day's work, it was necessary to restore the rails on the bridge as the work progressed. A sufficient number of track laborers, together with the necessary foremen, were provided to handle the track work. These men were organized into four gangs, one of which dismantled the track ahead of each carpenter gang while the other two gangs reconstructed the track behind the tie-renewal work. Two tie-boring machines and two pneumatic spike drivers, the latter operating from the air line already mentioned, were used in restoring the track.

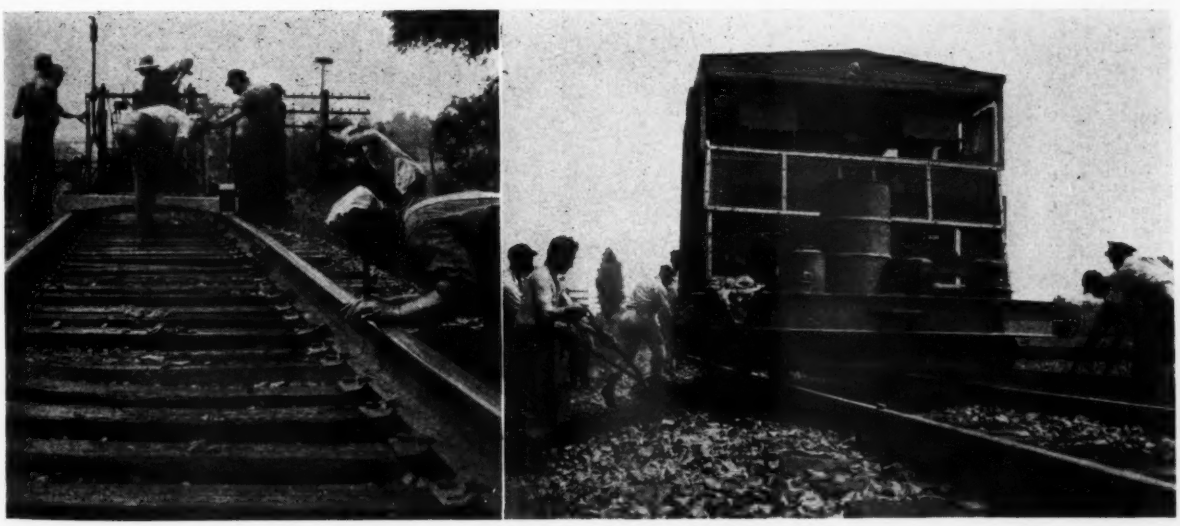
The renewal of ties on the eastward tracks was completed in seven working days, exclusive of two days required in removing and replacing the guard rails.

### The Westward Tracks

The ties on the westward tracks, No. 3 and No. 4, were renewed during October. The methods used were similar to those employed in May, except that the westward freight track (No. 3) within the limits of the bridge, was left out of service during the entire period. The westward passenger track, however, was restored to service each night. As a preliminary measure to this phase of the work, the temporary crossover at the west end of the bridge was reversed in position so that westward trains could operate against the current of traffic from "BG", east of the bridge, to the crossover, and then return to Track 3. Also, the temporary platforms at Beaver and Beaver Falls-New Brighton were shifted to serve Track 3.

All of the work on the westbound tracks was completed in six days. One day, Monday, October 20, was spent in removing the guard rails and preparing for the job. During the next five days, using methods similar to those described above, the tie renewals for each day were as follows: 333 ties, 396 ties, 476 ties, 444 ties, and 78 ties. Although Track No. 3 was left out of service at night while the work was under way, the track forces reassembled as much of it as was possible during each working day, so that relatively little work was necessary to restore it to service at the end of the day. In addition to installing 78 ties on the last day, the guard rails were replaced and Track 3 was restored to service.

The tie-renewal project on the Ohio River bridge was planned and carried out under the general direction of J. P. Ensign, engineer maintenance of way of the P. & L. E., and was in direct charge of C. W. Schlosser, supervisor of bridges and buildings, both with headquarters at Pittsburgh. Track forces engaged in the project were supervised by M. J. O'Connor, supervisor of track, with headquarters at Beaver Falls.



## Power Tamping on the New York Central

**A CONSIDERABLE amount of track surfacing work is now being done on the New York Central with the aid of a combination of machines, including Power Track Ballasters and power track jacks. This company now has 26 power track ballasters in operation on its lines.**

**When surfacing track with this combination of machines the power track jack operates about 100 yds. ahead of the power ballaster, raising the track to the desired level. The two machines are used in connection with a gang of 40 to 50 men. Six of these men work with the power ballaster, these including a foreman, a machine operator and four track laborers. Working two on each side of the machine, the laborers fork additional ballast, as necessary, into position for tamping by the power track ballaster.**

**The experience of this road is that generally the power ballaster will complete the tamping of a crosstie with 6 blows in 16 sec. Ties at the rail joints receive seven tamping blows. When operating with a full crew the output of the machines on this road is 400 ft. of track tamped per hour worked.**

**A trailing gang working behind the power ballaster, and using pneumatic tampers, does a clean-up job of tamping between occasional ties that lie too close together to be tamped by the power ballaster. In the views above the one at the left shows the foreman sighting a raise for a power jack, while the one at the right shows a power ballaster in operation.**

# This Remodeled Station Will Please the Customers

IN HARMONY with its policy of modernizing stations in the smaller cities on its lines, the Chicago & North Western recently remodeled the interior of its passenger station at Mankato, Minn. Built in 1896 of brick with stone trim, a portion of the structure has two stories, with unused division offices on the second floor. The former floor plan was the familiar old-fashioned type with the ticket office separating the general waiting room and women's rest room at one end from the men's smoking room and rest-room facilities at the other end.

### Old Partitions Removed

In general the remodeling work consisted of the removal of partitions to form a single large general waiting room with new larger windows and relocated doors; the provision of new and modern toilet rooms; the installation of convector-type heating units and fluorescent lighting; the reconditioning of the existing terrazzo floor; and the reconstruction of the ticket office. A portion at one end of the building was partitioned for offices, and a new stairway to the second floor was constructed. The final result, as shown in the accompanying view, is an interior that is modern in design and pleasing to patrons in appearance and comfort.

Plaster walls and ceiling, painted pastel green, contrast with an unusually high wainscot of varnished mahogany Flexwood with a baseboard of terrazzo. Parcel lockers are partially recessed, as are most of the heating units. The new interior features comfortable, leather-upholstered furniture of tubular metal construction, which has proved popular with patrons. Other seats, of the fixed type, arranged in the arc of a circle, are located in a glass-block-enclosed bay on the opposite side of the room from the ticket office.

The waiting-room side of the new ticket office is curved outward, and is enclosed with plate glass above the ticket counter along its full length. A horizontally-sliding glass panel provides an opening for dealing with patrons. The top of the ticket counter is covered with black cigarette-proof Formica, and a toe space is provided at the bottom.

### Ticket Window

An interesting feature of the ticket window partition is a full-length opening at the top for ventilation which is also utilized to give an unusual indirect-lighting effect. This effect is produced by light from fluorescent tubes on the inner side of the partition, which is reflected through the opening over the ceiling of the waiting room.

The modernization of the station was carried out under the general direction of E. C. Vandenburgh, chief engineer of the North Western, with the design features under the direct supervision of L. C. Winkelhaus, architectural engineer.

General View of the Remodeled Interior of the North Western's Station at Mankato, Minn.

# Renewing the Trackwork at a Congested Interlocking

**Recently it became necessary to replace the rail and special trackwork at a heavy-traffic interlocking in Chicago carrying the movements of three railroads—the Gulf, Mobile & Ohio, the Santa Fe and the Illinois Central. The work involved the renewal of three double-slip switches and two movable-point crossings, all in a heavier rail section and on a somewhat different alinement. By assembling the units of special trackwork in advance and by installing them in accordance with a carefully-arranged schedule the work was done quickly and with little or no delay to traffic.**

By E. M. UNZICKER
Division Engineer
Gulf, Mobile & Ohio
Bloomington, Ill.

THE Gulf, Mobile & Ohio, Northern region (Alton Route), recently replaced the old 90-lb. rail and the special trackwork through the limits of its electric power-operated interlocking plant at Bridgeport bridge across the south fork of the south branch of the Chicago river with new 112-lb. material. In this project the units of special trackwork were preassembled, using a girder stiffener system for the double-slip switches, and were handled into position with cranes with little or no delay to traffic.

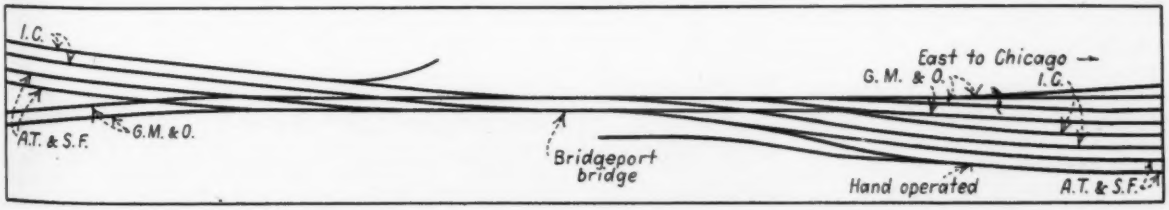
At this plant two main tracks each of the Atchison, Topeka & Santa Fe, the Illinois Central and the G. M. & O., making a total of six main tracks, come in from the south and west, converge into two mains across the bridge, and then fan out again into six main tracks, plus two G. M. & O. yard tracks, or eight parallel tracks, continuing north or eastward. A tangent alinement prevails across the bridge and for a very short distance either side. West of the bridge the mains curve in two directions. East of it there are reverse curves within the limits of the plant.

A new design of the track layout was developed for this location which called for not only heavier rail but a new alinement, and new units of special trackwork of different characteristics, all in different locations than the old ones. Consequently the whole face of the layout was changed completely. Therefore, the units of trackwork had to be placed, one by one, to connect temporarily into the remaining layout. In all but two cases the plant was restored to normal operating routes at the end of the day's work.

Through this plant pass upwards of 125 train movements daily but, by proper detouring, the construction was done with little or no delay to trains. The detouring was simplified by the fact that the Santa Fe could detour in either direction over the Illinois Central, or vice versa, sometimes within the plant and always within a reasonable distance, and the G. M. & O. could use one or the other of its two mains. Thus all trains were kept moving on schedule at all times.

The construction work was greatly expedited by the installation of a loud-speaker system which was operated from the interlocking tower. Thus all workmen had the benefit of

**Left—The Double-Slip Switches and the Movable-Point Frogs Were Pre-Assembled at Locations West of the Bridge. Below—The Track Layout at Bridgeport Bridge**



advance notice of the movement and exact routing of trains. In addition to being helpful in timing the work, this system was of vital importance in warning the workmen who were thus enabled to keep in the clear of the many trains moving on intricate routes.

The special trackwork that was installed in this work consisted of the following, all operated by power switch machines:

One No. 10 crossover
Seven additional No. 10 turnouts
Three No. 10 double-slip switches
One No. 10 movable-point crossing
One No. 10 moveable-point crossing on curve—special
Switchpoint derails, etc.

In planning the work a tentative construction schedule was first prepared, showing the possible or necessary detours required in each case, and given to the operating representatives of the three railroads. Because of the conditions encountered the steps indicated on this schedule could not be followed 100 per cent in numerical order, but it did give a definite understanding regarding detours, etc., to all those concerned in each step.

### Decide on Prefabrication

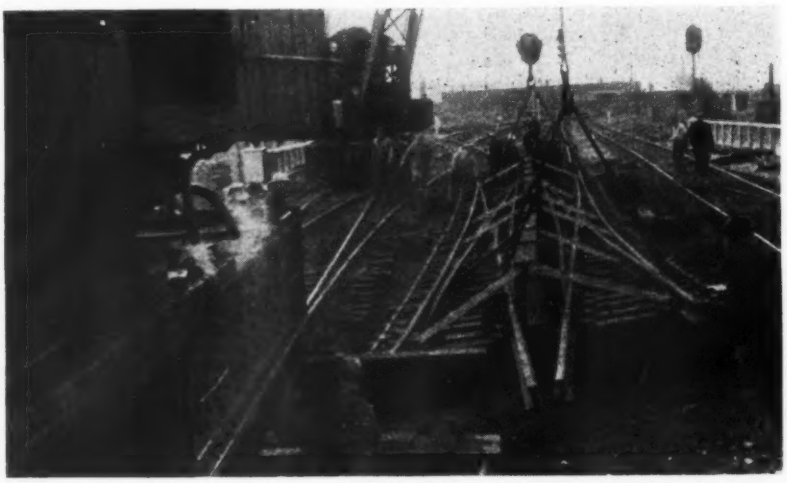
In such a busy location the time element was, of course, an essential factor in all the steps. To assemble, piece by piece, each unit of trackwork after taking out the old would have been a long, tedious, hazardous task, with traffic diverted for days from its normal route. Therefore, it was decided to assemble, out of track, the three No. 10 double-slip switches and the two movable-point crossings, and then, to install them, one by one, by taking out the old unit and setting in the new one by locomotive cranes. There was no space east of the bridge for assembling the double slip and crossing to be installed there, and there was no room for those west of the bridge immediately opposite where they were to be installed. Therefore, five locations were chosen about 500 ft. west of the bridge where the units could be assembled.

At each of these locations the ground was first leveled off and a series of old 8-in. by 16-in. bridge stringers were laid flat in two parallel lines 7 ft. apart. On this platform were placed the new switch ties for about 34½ ft. in either direction from the center for the double-slip switches, and from end to end of the knuckle rails of the movable-point crossings. (The end frogs in each case, of course, were not attached but placed after the assembled portion had been set in its final position.). Then the entire unit (except the end frogs) was assembled on the switch ties and completely bolted and spiked. The power switch machines were installed and tested, and the assembly as a whole was placed in working condition, with no more work to be done after placing except to bolt on the end frogs, connect the cable wires to the switch machines and make adjustments.

### I-Beam Stiffener Used

By disconnecting one point and closing both pairs of switch points in each double-slip assembly, sufficient space was created to permit the placing longitudinally, on the long diagonal, of a 7½-in. by 24-in. I-beam, weighing about 100 lb. per foot, directly on the gage plates. This beam was formed from two scrap track-scale beams, placed end-to-end and spliced together by a 1-in. plate on each side of the web, bolted with 49 one-inch bolts, and by plates bolted to the top and bottom flanges, forming a fairly rigid girder 68 ft. long.

Bridge carpenters fastened this beam securely to the prefabricated double-slip switch by means of ten sets of plates and steel rods spaced at regular intervals. Each of the sets included two 1⅛-in. by 4½-in. by 18-in. steel plates containing two holes on 14-in. centers. One of the plates was placed on top of the I-beam and the other beneath a switch tie at the same location. Each assembly also embraced two 1-in. round bars, 40 in. long, each threaded 4 in. at both ends. These rods were placed on each side of the I-beam with their lower ends extend-



**Left—Double-Slip Switch, with Stiffener Girder in Place, Being Lowered Into Final Position by the Cranes. Below—Just Installed, and with End Frogs in Place, This Double Slip Is Being Levelled Up in Preparation for Receiving Traffic**

ing through the bottom plate, which was placed diagonally under the switch tie, and their upper ends through unthreaded holes in the top plate.

Instead of using nuts on the lower ends of the rods, the holes in the plate under the switch tie were threaded to make a stud assembly and to permit easy removal of the rods. The upper ends of the rods were fitted with washers and nuts so that, by running the nuts down, the rods or studs could be placed in tension, binding the assembly together. To complete the assembly 3-in. by 4-in. wood braces, cut to the proper length, were placed at intervals along each side of the girder, with one end wedged under the top flange and the other end braced against the rail. About 1½ hr. were required for six bridge carpenters to fasten the I-beam in place on each puzzle and brace it, with the work of removal being done in 15 min. after the puzzle had been placed.

### Assemblies Weighed 40 Tons

Each double-slip assembly was estimated to weigh about 40 tons, and the over-all length, measured along the center pair of rails, or toe to toe of the end frogs, was 87.7 ft. In preparation for inserting each assembly the ballast between ties, within the limits of the corresponding old unit, was cribbed out to a depth of 2 in. below the ties, and the balance of the ballast was removed to that level immediately after removal of the old function. This was done so that the top of rail of the new trackwork, with its increased depth from bottom of tie to top of rail, would be no higher than that of the unit removed.

At the proper stage and time for the renewal of a given slip switch the affected tracks were taken out of service, the old puzzle was cut in half by a torch, each half was picked up by a self-propelled Diesel crane (clam shell) with a 50-ft. boom, using chains hooked around the rails at four balancing points, and loaded on a flat car and moved away. This procedure required only a few minutes.

### Handled with Two Cranes

Two cranes were needed to handle each new slip switch. Only one self-propelled crane was available, so we were obliged to use a steam wrecking derrick for the other unit. This slowed up the installation time somewhat since the derrick had to be moved with a locomotive and had to remain in one place with blocked-up outriggers once the boom was swung out to one side. The clam-shell crane, on the other hand, was weighted sufficiently to handle this load on any reasonable radius, a desirable characteristic since the procedure was to move in on a serviceable track parallel, at 13½-ft. centers, to the location of the puzzle involved.

With a crane at each end, using four chains hooked around the rails and under the ties, each new puzzle was picked up at its point of assembly, then swung in between the cranes over the running track and carried low to a location opposite the point of installation. After the wrecking derrick had been blocked, the booms of both cranes were swung out to set the puzzle in place. The net time required for this pickup and delivery was from about 30 min. to 1 hr.

### Loaded on Flat Cars

Because of the low portals of the bridge, the puzzle and movable-point crossing for installation east of the bridge had to be first loaded on a flat car, which was then switched over the bridge to the east side where the units were unloaded and set in place as described above. The movable-point crossings were handled by the clam-shell crane alone and without the girder stiffener, the rails being of sufficient girder strength to carry the assembly, which was about 25 ft. long overall of the ties and 32 ft. 4 in. overall of the longest rails.

### Rail-Laying Gang Employed

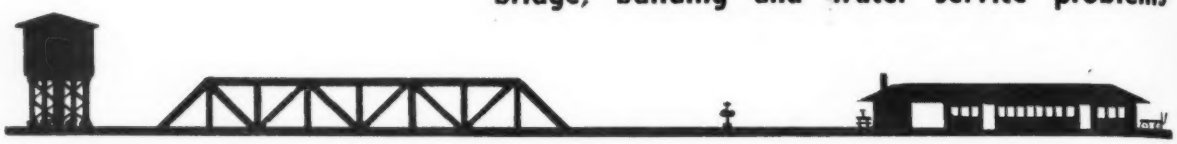
For performing the track work on this job a steel-laying extra gang averaging 25 men was sent to this location on September 15, 1947. This gang began stripping out ballast and assisting the local six-man section gang, together with signal-interlocking men, to assemble the new double slips and movable-point crossings. On September 25, two other small section gangs were added to the force, and the replacement work was started by setting a new double slip. The construction work then proceeded continuously using only these forces, plus the bridge carpenters, cranemen and work-train crews only on days when puzzles or crossings were actually installed. The last steel work was completed on October 16, and reballasting and surfacing started.

On one day, when a combination of poor breaks was encountered, plus an attempt to set both a puzzle and a movable-point crossing, the force worked until dark. At other times a small amount of overtime was necessary, but generally it was possible to hold fairly well to 8-hr. days. We were fortunate in having good weather during the work, and excellent cooperation in the detouring and handling of train movements. It is believed that the rate of progress achieved was fairly good, especially in view of the fact that all tracks throughout the plant had to be shifted, some as much as two and three feet and in view of the heavy traffic at this point.

An Allis-Chalmers 37.5-HP. HD-5 Diesel-Powered Crawler Tractor, Equipped with a Tracto-Shovel, Placing the Ballast at a Highway Grade Crossing for a New Spur Track Under Construction at Vernon, Calif.

# WHAT'S THE ANSWER?

**An open forum for maintenance men on track, bridge, building and water service problems**



## Making Salt-Resistive Concrete

*How can concrete for use in station platforms and driveways be made resistive to the adverse effects of salt and calcium chloride used for ice removal? Explain.*

### Use Air-Entrained Cement

By L. H. Corning
Assistant Manager, Structural and Railways Bureau, Portland Cement Association, Chicago

The increasing demand for safe station platforms and walkways and the demand to keep roads open to traffic to provide safe traveling conditions during winter months have led to the widespread use of flake calcium chloride or rock salt to remove ice. In locations where climatic conditions are severe and repeated applications of the salt have been made to keep the pavements free of ice, some of the pavements have evidenced surface scaling. The extent and severity of the scaling have been affected not only by the amount of the salts used and the frequency with which they have been applied, but also by the quality of the concrete.

Concrete pavements of excellent quality naturally have greater resistance to freezing, thawing and salt action than do pavements built of inferior concrete. At the same time, pavements which would give excellent service under all other exposures may be damaged by heavy salt applications, especially if they occur early in the life of the pavements. Concrete pavements less than approximately four years old are much more vulnerable to damage from this cause than are pavements of greater age. Much injury has been caused by applying salt to walkways and other surfaces when the concrete had been cured for only a few weeks.

The resistance of the concrete to the effects of freezing and thawing and to salt can be greatly improved by using air-entrained concrete. In such concrete there are billions of minute, disconnected air bubbles distributed throughout the cement paste. The effectiveness of the entrained air in improving the resistance of the concrete to these exposures has been demonstrated by many laboratory tests, field trials and actual jobs during the past eight or nine years. These indicate that the concrete should contain not less than three per cent air and not more than six per cent. Larger amounts of entrained air reduce the strength unnecessarily without further improvement in durability.

Air-entrained concrete can be produced by using air-entraining portland cement or by adding air-entraining agents to the batch in the mixer. There are several such agents available and the air-entraining cement is now generally available. The entrained air produces a more workable, cohesive concrete having less tendency to segregate and less bleeding of free water to the surfaces.

There is a slight decrease in the strength of the concrete as the air content is increased, but certain adjustments may be made in the mix to minimize this. The entrained air increases the volume of concrete produced by a given amount of cement, so that reductions in the amounts of the other ingredients may be made to maintain the same cement factor that would be used in concrete without entrained air. The improved workability will permit making reductions in the amount of sand and water. In some cases a somewhat stiffer mix can be used, which will permit a further reduction in the amount of water and consequent improvement in the strength of the concrete.

The amount of air entrained in concrete can be determined by using the instructions of the American Society for Testing Materials contained in their "Standard Method of Test for Weight per Cubic Foot, Yield and Air Content of Concrete, designation C-138". This method is difficult to use in the field. More practical methods and equipment for field use are described in the Journal of the American

**Send your answers to any of the questions to the What's the Answer Editor. He will welcome also any questions you wish to have discussed.**

### To Be Answered In the April Issue

1. *To what extent is crib cleaning desirable in connection with out-of-facing surfacing? Where the cribs are cleaned, how deep should the cribbing be done? Should the depth be uniform throughout the length of the tie?*
2. *How should facilities for handling and storing Diesel fuel oil be protected against fire? Explain.*
3. *How can a yard foreman best maintain true grades and good surface on hump and other important tracks in classification yards? What effect have heavy rail and good ballast? Can permanent grade stakes be placed? How?*
4. *What is the best method of fastening the track structure to the steelwork of open-floor bridges? What is the purpose of such fastening? Explain.*
5. *What precautions should be observed in the care and use of slitting and grinding wheels in track work to prolong their life, increase their effectiveness, and reduce the hazard of accident? Explain.*
6. *In what fundamental ways is the trend toward Dieselization on the railroads affecting water service organizations, existing plants, and plans for new facilities? Explain.*
7. *Can the annoyance to adjacent property owners, where high-speed passenger trains have a tendency to kick up a large amount of dust when passing through towns, be minimized or prevented? How?*
8. *What are the best methods of cleaning asphalt tile floors? How can the luster be maintained with minimum hazard of slipping?*

Concrete Institute for May, 1947.

The Portland Cement Association publishes two information sheets giving further information on air-entrained concrete and on pavements for station platforms. They are entitled "The Elimination of Pavement Scaling by Use of Air-Entraining Portland Cement" and "Specifications for Railroad Station Platforms on the Ground". Both may be obtained from the association without charge.

### Don't Use Salt

By E. M. Grime
Consulting Engineer, St. Paul, Minn.

Instead of attempting to make a concrete which is resistant to strong alkaline salts, the use of these salts should be prohibited for melting ice on station platforms and driveways. Since clean sharp sand is very effective it should be used instead. This is particularly true around depots and other buildings where salt carried in on the feet of pedestrians causes serious deterioration of any wood and most synthetic flooring surfaces. Terrazzo or concrete are about the only common floors not affected by tracked-in salt. Salt is also injurious to the carpets or wearing surfaces in all passenger car equipment—another reason why its use should not be tolerated on platforms.

When sand is used, it is a good plan to store it adjacent to a furnace or hot steam pipes where it will be thoroughly warmed, so that when it is spread over the ice it will quickly melt its way into the surface.

At important locations the installation of radiant heating in concrete platforms may be a justifiable expense, not only for keeping the platforms free of ice, but also to make snow removal unnecessary.

### Better to Use Asphalt

By F. R. Spofford
Assistant Division Engineer, Boston & Maine, Dover, N.H.

Extensive benefits are claimed for various additives that produce entrained air in concrete, and for natural cements that have the same effect. Among such benefits are durability and resistance to the effects of salt or calcium chloride.

On the basis of observations of concrete highways and my personal experience with concrete on platforms and curbs, I consider it impracticable to use portland cement concrete at the latter locations. Any type of bituminous concrete, mixed by an experienced contractor, and applied, either by outside or company forces, is preferable to portland cement concrete. The choice of whether to use a hot or cold asphaltic mix will be governed by the location of the job with reference to batching plants.

The use of such concrete for curbs should be avoided, particularly if in precast units. If split granite or other resistant stone cannot be obtained, bituminous concrete can be molded into satisfactory curbs by an experienced workman.

As a general proposition, platform work is a paving job. Trained and skilled workmen working for experienced contractors will generally produced results much superior to those that can be attained by company forces.

# Rail Failures in Crossings

*What are the most prevalent types of rail failures occurring in highway crossings? What causes these failures? What can be done to reduce them?*

### Many Failures Under Head

By H. E. McCurdy
Assistant Chief Inspector, Sperry Rail Service, Hoboken, N.J.

We do not, at the present time, maintain statistics on the location in track of defective rails, and thus no specific data is available here on the number of rail failures occurring in crossings. The cause of such failures and preventive measures more properly fall within the scope of track maintenance—on which subject our company has never attempted to speak with authority.

Observations of our field personnel, however, may be of some value. Such observations indicate that any type of rail defect can occur in a grade crossing. The most prevalent type, however, seems to be the head and web separation. No accurate data has been compiled, but it is estimated that the vast majority—approximately 75 per cent—of the head and web separations detected by our detector cars have been found in crossings. These are not readily visible to inspecting track forces and management, who, of necessity, must rely on detector cars.

Generally, it can be said that the principal causes of head and web separations in crossings are: (1) Stress reversals resulting from loose gravel and other roadway material being "splashed" on the running surface of the rails; (2) the impacting of filler material; (3) corrosion fatigue, possibly due to acid formation caused by moisture on some types of filler.

Head and web separations are readily detected by detector cars. That this type of defect, while dangerous, does not occur as frequently as other longitudinal defects in the heads of rails is indicated by the fact that our detector cars regularly find something less than one head and web separation per 100 track miles tested.

### Joints Fail Frequently

By H. S. Ashley
Engineer of Track, Boston & Maine, Boston, Mass.

Rail failures in highway crossings are largely confined to failures within the limit of the joint bar. These failures are caused by improper maintenance of the joint owing to the ties being covered with the highway surfacing material. The joint gets low, pumping starts, the rail becomes overstressed, and failures occur. These failures usually start at the bolt holes and progress until a section of the head becomes loosened.

The elimination of joints by butt welding the rails through the area covered by the highway surfacing will eliminate this type of rail failure.

### Most Are Fatigue Failures

By Russell S. Jensen
Special Research Associate in Engineering Materials, University of Illinois, Urbana, Ill.

One of the most prevalent types of rail failures in highway crossings is the head and web separation. In this type of failure cracks starting at the juncture of the head and web in the upper fillet, gradually spread until complete separation or fracture oc-

curs. These are fatigue failures, undoubtedly accelerated by corrosion due to moisture retained in the crossing. The corroding strength of this moisture is increased greatly by brine drippings, leaching of coal and cinders, etc. The eccentric loadings which result from small pieces of gravel or other material carried from the highway and deposited on the rail may easily produce upper fillet stresses large enough to start fatigue cracks.

The most widespread reduction in this type of failure will probably be achieved through the use of the recently adopted 132-lb. and 115-lb. rail sections in which the upper fillets have been increased to ¾-in. radius compared to ½-in. radius on the 131-lb. section and ⅜-in. radius on the 112-lb. section. This thickening of the upper fillet will reduce the stresses materially in that region where fatigue cracks have been occurring.

Other means of reducing these failures have shown some promise in the laboratory. Laboratory fatigue tests on specimens cut from rail webs have been made under a range of stress (based on stress measurements with electrical wire gages in the field) from a maximum compressive stress to a tensile stress 20 per cent as great. Under these conditions it was found that shot-peening the specimens raised the endurance limit 32 per cent over that of specimens not shot-peened, or from 59,000 p.s.i. for the specimens with the original as-rolled surface to 78,000 p.s.i. for the shot-peened specimens. Whether the beneficial effects of shot-peening the upper fillets of rails in highway crossings would endure for a long period of time is somewhat questionable since the shot-peened surface would also be susceptible to rusting and corrosion.

Laboratory tests also show promise for certain corrosion-resistant paints, inasmuch as fatigue specimens coated with these paints withstand, under a strong acid solution, several times as many cycles of stress as unpainted specimens. Here again the question arises as to how long the coating would endure under service conditions, or whether it would crack, peel or scale off. It is possible that a combination of shot-peening and painting with corrosion-resisting paints would be very effective in reducing fatigue failures in crossings.

In addition to head and web separations, joints within crossings are a source of rail failure from cracks developing from the bolt hole to the rail end. Such joints are, as a rule, difficult to maintain, and since lack of sufficient bolt tension results in a severe increase in the range of web stress under traffic, these failures may develop, perhaps aided by corrosive effects. The elimination of joints within the crossings by use of 60 or 78-ft. rails on the smaller crossings would be a solution for this type of failure, while welded rail could be used through the larger crossings.

# Use of Altitude Valves

*What is an altitude valve? Under what circumstances is its use indicated at water stations? Explain.*

## Altitude Valves Reliable

By C. A. Smith
Supervisor Bridges and Buildings, Indiana Harbor Belt, Hammond, Ind.

An altitude valve is a valve which is closed by static pressure or altitude of water or liquid in a tank. It is controlled by a diaphram into which a back-pressure line is connected. This can be tapped as close as two feet from the altitude valve on the tank side. A pin on the diaphram opens a pilot valve. This opens an orifice to the top of a floating piston, forcing it into a closed position, cushioning it so that it closes entirely without hammer. For convenience such a valve can be located in the feed line from 15 to 1500 ft. from the tank. This has been a great help to me in one location where we have a valve 1500 ft. from the tank adjacent to a sewer line. We have another valve located in a heated pump house 1300 ft. from the tank.

An altitude valve replaces the old conventional float valve located in the tank. This type of valve holds the water level within a few inches of where it is wanted, winter and summer. While the altitude valve is not new, it is not an experiment.

From a safety standpoint alone this valve is a life saver. I have been inside a 100,000-gal. water tank with three feet of ice on the sides and the float frozen in the top. After breaking the float loose the ice fell, damaging the float valve, which then had to be replaced. In the zero weather that prevailed at the time, this was a hazardous job. During a severe winter float valves sometimes freeze three or four times. Even in good weather it is dangerous to climb into tanks and repair float valves.

When an altitude valve is used there is no reason for climbing into the tank unless an outlet spout is connected directly to the tub. Even then an outlet valve requires practically no maintenance. We have reversed the action of a float valve, using it as an outlet valve, without any maintenance for as long as three years. Then only the rubber seat and cup leathers needed to be renewed.

Altitude valves can also be procured which are double acting in that they stop the flow of water into the tank when it has reached the desired height, or they let the water return to the feed line when the line pressure is less than the static pressure. Also, an altitude stop check valve is available which holds the tank full but allows no water to return to the feed line, regardless of the amount of pressure.

## Reduce Winter Maintenance

By Water Service Repairman

A pressure valve that is designed to control automatically the storage level in an elevated tank, reservoir or standpipe is generally called an altitude valve. It is opened and closed by hydraulic pressure acting on a pilot-valve diaphram. This diaphram is usually sensitive to pressure differentials equivalent to a head of water of from 3 to 12 in. Some types of valves may be even more sensitive.

Altitude valves are used most extensively in cold climates where difficulties arise from the winter maintenance of float valves in tanks. Such pressure valves are very economical to maintain, having only two inexpensive renewal parts, which take all the wear and eliminate other metal to metal contacts.

One of the distinct advantages of this type of control valve is the flexibility that permits its installation at the most convenient spot in the supply line, whether near the tank or a quarter of a mile from it. The usual procedure, if possible, is to install the valve at the base of the tank in a valve pit adjacent to the tank riser. This insures frost protection and avoids surge impulses against the diaphram. Valves of this general type may be varied for insertion in a line used for both discharge and supply; or so arranged as to close instantly to conserve the storage supply in case of a line break; or equipped with solenoid controls so that they can be closed electrically from remote points.

# Supplying Good Drinking Water

*What are the most effective ways to provide an adequate quantity of cool and sanitary drinking water for section gangs? Extra gangs? Explain.*

## Likes Fountain Tanks

By P. H. Croft
Division Engineer, Illinois Central, Chicago

Providing an adequate supply of cool and sanitary drinking water for section and extra gangs has always been a problem, which has not been solved with any degree of complete satisfaction.

In providing water, consideration must be given to the number of men in the gang, the general locality, where the work is being performed, and other local conditions. For small gangs up to six men, we have used an insulated type of water cooler of four-gallon capacity, purchased from the Works Progress Administration, with very satisfactory results. This cooler is equipped with a drinking-fountain jet nozzle, the water being forced out by a pump attached to the container. The water placed in the cooler remains at approximately the same temperature for about eight hours.

Where large gangs are used, the most satisfactory method seems to be a 20 or 30-gal. keg, equipped with a tight cover. When weather conditions are such that the water may become warm before the supply is depleted, an adequate supply of ice is added. When this method of supply is used, it is necessary to use dippers or cups. From a sanitary point of view this is objectionable.

In some localities, where there is an inadequate supply of good drinking water, or a gang is located in cars some distance from a water supply, it may be necessary to transport water in a tank car and supply the men from the car. When this is done the usual method is to furnish kegs and a supply of ice for use where the work is being done.

## Individual Cups Desirable

By R. L. Baucom
Research Department, Missouri Pacific, St. Louis, Mo.

For many years the water keg and dipper have been more-or-less standard equipment for most gangs. Each small section or bridge gang usually located its keg in the shade nearest its place of work and the men lost little time in getting their drinks. In larger gangs a water boy supplied the workers with water carried in buckets.

Filled from a source of supply which had been approved for drinking purposes, these charred or parafined kegs kept the water cool and seemingly sanitary. When ice was available it could be washed and placed in the keg. When this was done carefully there was little likelihood of contaminating the water. A real cause for concern arose, however, when one man after another used the same drinking cup. While this practice is still being followed, and even though few cases of illness have been traced directly to this cause, it is generally considered desirable that each man have his own cup. It would also seem advantageous to insert a strong spout or spigot in the keg near the bottom so the men can draw off water without the necessity of immersing the dipper in the water after each drink.

The admitted inconvenience of this system of individual drinking cups has been considerably reduced, if not solved, by available portable water carriers, having capacities of about four gallons, and which are equipped to carry disposable paper cups. These small water tanks are adequate for small gangs of from four to six men but are entirely too small for larger maintenance gangs.

There does not seem to be any better method of supplying these large gangs with drinking water than the use of kegs, buckets and dippers. In such cases the desirability of having individual drinking cups seems to be overruled by their impracticability.

# Prestressing Cover Plates

*When additional cover plates are added to existing plate-girder bridges, what advantages are there in prestressing them? How can this be accomplished?*

## Railroad Use Uneconomical

By A. A. Visintainer
Engineer of Structures, Erie, Cleveland, Ohio

This question of pre-stressing cover plates is all embracing and I am pre-supposing that the pre-stressing is to be done by the application of heat and therefore applies to the tension flange only.

From a purely theoretical standpoint there is an advantage in pre-stressing in that, if properly carried out, it will permit the additional cover plates to take their share of the total load (dead + live + impact). This theoretical advantage, of course, would only be true when the existing tension cover plates remain undisturbed, that is, where the rivets are not removed. Otherwise both the existing and additional cover plates would require pre-stressing.

Although the amount of pre-stressing required for each plate can be readily determined by well-known formulas, the actual pre-stressing of each plate to its proper amount would be difficult to accomplish on a riveted structure. One reason for this is that the holes in the various cover plates and flange angles would not match. To surmount this difficulty it would be necessary to resort to welding of the cover plates.

Generally speaking, the dead load stress is a small percentage of the total stress in the girders of railroad bridges. In such cases, from an economic standpoint alone, there would appear to be no particular advantage to be gained by pre-stressing. Conceivably, pre-stressing might be advantageous on highway bridges where the dead load stress represents a large percentage of the total stress.

On this road we have not as yet resorted to the pre-stressing of additional cover plates when strengthening existing bridges. Our practice has been to install falsework, where feasible and economical, to remove the dead load deflection. Where the installation of falsework is impractical, additional cover plates are designed to carry their proportionate share of the live and impact loads only.

## Desirable—But Hard To Do

By Assistant Engineer of Bridges

On our system we seldom add cover plates to existing deck-plate-girder bridges while they are in service, and under present density of traffic we would not attempt to do so on spans in excess of 40 ft. in length. When strengthening a deck-plate-girder span we have found it expeditious to secure another span and change out the weak one. The span used may be secondhand, either of the required length or cut down

to the required length, which has been strengthened and repaired.

On some of the shorter deck-plate-girder spans we have, in the past, added cover plates. We generally drive a pile bent at the center of the span to stabilize the girders while the work is being done and to absorb at least a portion of the dead load.

The matter of pre-stressing additional metal to apply in the form of new cover plates is a desirable objective, but we have found it difficult to accomplish. It is a simple matter to determine the total elongation in the cover plate which will result from dead load stresses. This can be taken up by lessening the rivet spacing in the new cover plate cumulatively for tension plates or increasing the rivet spacing for compression plates. A good rule of thumb method would be to increase or decrease the rivet spacing 1/16 in. for each 10 ft. of cover plate length. In applying the new cover plates the metal should be pinned and bolted from the center outward each way toward the ends in order to pick up stress. In cases where the new cover plates are to be placed on existing riveted flanges, the rivet spacing for the new plates would have to be detailed in decimal distances in order to obtain the desired results. Where the old top and bottom flanges are plain, welded cover plates would usually be applied. In such cases enough holes could be drilled concentrically in the old material to pin it and take out the dead load stresses before welding on the new plates.

# Ways to Control Woody Growths

*What are the latest developments in methods of controlling vegetation and woody growths? Can they be used effectively on railway rights-of-way? How?*

## Recommends 2,4-D Compound

By J. W. Brooks
Research Entomologist, Agricultural Chemicals Division, Ralston Purina Company, St. Louis, Mo.

The past few years have seen tremendous advancements in the field of weed control. Marked improvements have been made in equipment designed for the mechanical or physical destruction of plant life. The greatest strides made, however, have been in the development of chemicals to combat undesirable vegetation. Examples of some of the newer weed-killing chemicals or herbicides are: 2,4-D (2,4 - dichlorophenoxyacetic acid); 2,4,5-T (2,4,5-trichlorophenoxyacetic acid), ammonium sulfamate, and salts of trichloroacetic acid. These new chemicals will, in all probability, supplement or replace older, more costly, hazardous and inefficient means of controlling vegetation.

The 2,4-D compound is the so-called "growth-regulating" or "plant hormone" type of weed killer. In the concentrations used to control vegetation it is non-toxic to man and animals, non-corrosive, non-explosive, does not sterilize the soil, and is selective in its action. This chemical is selective in that it affects broad-leafed plants and is relatively ineffective against narrow-leafed plants such as grasses. The action on plants treated might be likened to that of blood poisoning in humans. When sprayed on the leaves, the chemical is taken into the leaf tissue, then transferred into the branches, main stem and down into the root system, thus poisoning the entire plant. The plant kill is rather slow, taking from three to eight weeks, depending upon the size and growth stage. Plants should be treated in the most active stage to obtain maximum killing action.

For vegetation control, 2,4-D is used in the form of salts and esters, such as sodium or triethanolamine salts or the isopropyl ester. The salts are soluble in water, and the esters will mix with either oil or water. The ester forms are the most active and are recommended for use in the control of waxy-leafed and woody plants. Applications can be made using the materials dry as dusts, or in water or oil as sprays. Relatively small quantities are needed to effect control. The application of 2 to 2½ lb. of the isopropyl ester per acre of foliage will afford excellent control of a typical vegetation problem. Stumpage may also be effectively treated using the ester—one-half per cent by volume in a kerosene-type oil. This application is most effective when made in the fall, within six weeks after cutting.

Compounds of 2,4-D have been used and tested during the past three years. Investigations carried on by the research department of our company show the isopropyl ester of 2,4-D to be effective in controlling such common woody plants as alder, aspen, birch, box elder, cottonwood, elderberry, elm grape, hazel, poison ivy, sassafras, sumac, trumpet vine and willow.

This past season preliminary tests were carried out with another of the "plant hormone" type of weed-killing chemicals, 2,4,5-T. Compounds of 2,4,5-T are similar in their properties and activities on plants to those of 2,4-D. This chemical will, in all probability, be more expensive than 2,4-D; extensive research investigations to be conducted during 1948 will determine if it can be used commercially. At present it looks promising for the control of raspberry, blackberry, dewberry, hawthorn and osage orange.

Ammonium sulfamate is a non-selective herbicide which kills certain types of vegetation by contact and may also act as a system poison. It is relatively non-poisonous to man and animals, and free from fire hazards, but is corrosive to certain types of spray equipment and expensive to use. Under certain conditions it will sterilize the soil for a short period of time. Rather large amounts of this material must be used per acre to achieve the desired vegetation kill. It may be used dry, but is usually applied as a spray of 1 to 3 lb. per gal. of water. One gallon of this solution will treat about 100 sq. ft. Ammonium sulfamate is best utilized to kill stumps and eliminate poison ivy.

Salts of trichloroacetic acid are also new weed-killing chemicals that are in the preliminary testing stage. Their action on the plant is chiefly through contact and as temporary soil sterilants. These materials look very promising as control measures for some of the noxious grasses, such as Johnson grass. Investigations during the coming season should determine if they will prove to be practical for commercial use, since to obtain control rather large amounts of the chemicals are required.

The most practical and effective method of vegetation control on the average right-of-way is through the use of weed-killing chemicals. Esters of 2,4-D have been proved by test and practical usage to be an effective and economical solution to some of these vegetation problems. The use of 2,4-D compounds not only eliminates and controls plants, but at the same time allows for the development of grass sods through selective action. Good sod reduces erosion and will prevent undesirable plants from becoming established.

Spraying with water solutions of esters of 2,4-D is the most effective method of treating vegetation on rights-of-way. Two and one-half pounds of the isopropyl ester of 2,4-D in 100 gal. of water will treat an average of approximately 1/10 mi. of right-of-way. As the undesirable vegetation disappears and grasses be-

come established, the same amount of material will go farther. Spraying equipment with a pump delivering 15 to 20 gal. per min. at 200 to 300 lb. pressure should be considered a minimum to make the job economical from an operation standpoint.

Compounds of 2,4-D, like any other chemical or mechanical means of destroying vegetation, are not "one-shot" eradicants, but are tools for use in solving these problems. In treating rights-of-way, the esters of 2,4-D should be utilized in a control program. Our recommendations, using the isopropyl ester, call for two applications the first two seasons and one yearly afterwards. The initial application should be carefully timed to catch the vegetation in the vigorous growth or succulent stage, and the second for treatment of later growth and sprouts. After the first two seasons, one well-timed application when the vegetation is growing vigorously will be sufficient. It is most economical to treat vegetation under 8 ft. in height, and best to start on woody plants within a year after the area has been hand cut. Certain types of woody growth, such as oaks, ash, maples and hickory, have been somewhat resistant to foliage treatments. However, treatment of cut stumps and sprouts has been quite effective.

Single treatments on rights-of-way containing wide varieties of herbaceous and woody plants have resulted in average controls of 70 per cent. Compounds of 2,4-D must be used with care around broad-leafed vegetable crops and flowers.

### New Chemicals Effective

By R. H. Gilkey
Division Engineer, Central of Georgia, Savannah, Ga.

This problem is very timely and one to which maintenance men have given considerable study. In the past the practice on most roads has been to cut the right-of-way each year, then, when the vegetation becomes dry, to burn it over under controlled conditions, such as plowing fire guards, back firing, etc. This procedure is expensive and must be followed every year. It seems to me that the time has come when this right-of-way cutting and clearing must and can be done by more effective methods.

We made a test of what is known as 2,4-D "killer" for weeds and woody stock—grass not being affected. Two quarts of the solution were mixed with 100 gal. of water and 20 gal. of kerosene, placing this mixture in a container under agitation. We attached a compressor to the container and sprayed the solution on the leaves of the woody bushes by means of a hose and nozzle. We found that if this is done at the beginning of the growing season, results begin to show up in about three weeks and that the bushes and weeds so treated do not grow any more that season. It is claimed that after the third year of such spraying the growth is eliminated entirely.

A test application on one track-mile of heavy growth in swampy lands full of gum, gallberry, persimmon and oak bushes required the following force and material: One operator (in charge of the entire operation); one motor car operator; a helper; a cook; a foreman and six men; and 7½ gal. of 2,4-D "killer" (approximately $7.50 per gal.) Vegetation on the mile tested was very heavy, but on the basis of this test there are many locations where such a gang can spray four miles a day. The spraying equipment can be mounted on an ordinary push car and additional push cars used to carry water for the mixture.

I believe that by using a sufficient number of sprayers all the right-of-way can be treated within a 30-day period during the beginning of the growing season, and that after a period of three years right-of-way cutting will be reduced 80 per cent. The cost would be normal during the treating period, but greatly reduced later. This method is only in the experimental stages, but if it should prove effective, it will save a great deal of money and time.

## Laying Rail Through Switches

*When new rail is being installed in long stretches of track, including interlockings and outlying switches, should the switch work be done prior to, during, or following the rail laying? Why?*

### Conditions Alter Methods

By E. J. Brown
Engineer of Track, Chicago, Burlington & Quincy, Chicago

Whether to lay switches with the same gang that relays rail depends on a number of conditions. If the relay involves an occasional switch, it should be taken care of by the same gang. On the other hand, where major alterations are to be made, such as relocating a turnout, changing its angle, or relaying rail through interlocking plants, a special gang of the proper size should do the switch work. Attempting to do the switch work under such conditions with the regular rail-laying forces is difficult and costly because it is impossible for the regular rail gang, with all of its machinery, to work in a restricted area and get maximum efficiency. Delays to the machinery slow up the entire production of the gang. A small special gang can not only handle the work more economically, but can do it with less delay to traffic. Furthermore, where power-controlled switches are involved, a smaller track gang can coordinate its work better with that of the signal forces and thus avoid the possibility of delays to traffic, and at the same time perform the work more economically.

### Use Rail Gang If Possible

By R. G. Simmons
General Track Inspector, Chicago, Milwaukee, St. Paul & Pacific, Chicago

When new rail is being laid, all switches should be installed by the steel gang as the rail-laying progresses, except where large interlockings or important switches are encountered that can only be kept out of service for short periods of time.

It has been proved that the most economical way to install switches is to have all the preparatory work, such as installing the necessary switch ties, drilling, distributing the switch plates, and marking out the switch, done ahead of the steel gang so that as it progresses it can install the switch. However, where steel gangs must relay through large interlocking plants and the amount of traffic is such that it is difficult to make detours except for short periods of time, it is advisable to install such switches with small gangs, which can install a complete switch at a time.

The number of switches ordinarily encountered by a well-organized steel gang will not retard the progress of the gang enough to justify the additional expense of organizing and maintaining a camp and equipment for a separate gang to do the switch

work. There is a further advantage in not having to issue slow orders covering the same piece of track for two different gangs.

### Requires Small Gang

By William Lindsey
Extra Gang Foreman, Chicago & Illinois Midland, Springfield, Ill.

When new rail is being installed in long stretches of track, including interlockings and outlying switches, the switch work should always be done either before or after the rail laying. If it is done during the course of regular rail renewal there will be an enormous waste of man-power and money. The answer lies in the single fact that there isn't enough room for a large gang to perform efficiently at an interlocking or a switch.

Changing rail through a switch is quite different from laying it between switches. It is more specialized. It involves strict attention to many details not normal to the usual operation of laying steel. Even small variations in gage and line are more serious and less easily corrected through switches than elsewhere. Neither lining nor gaging through switches can be done well by a large gang. It is a job for a small gang of specialists.

### Lay Rail First

By W. H. Sparks
General Inspector Track, (Retired), Chesapeake & Ohio, Russell, Ky.

While some may think it advisable to install switches ahead of rail laying, especially if the switch material arrives first, I do not agree that such is the best way. I lean toward the method of installing the switches after the rail has been laid.

If this is done, it is so easy for the roadmaster and foreman to use a tape to locate accurately all joints, stock rails, and insulated joints throughout the switch. Many of the cuts can be made prior to beginning the work of installing the switch material. Where such planning is possible, fewer cuts are necessary, and more efficient work can be expected.

If the rail gang installs the switches, the men will be crowded together too much; it will be hard to get good gage and line; and many man-hours will be lost waiting for others to complete their work and get out of the way. The rushing that is thus encouraged will cause sloppy work—which cannot be tolerated when installing switches.

# Colors for Station Interiors

*To what extent can the science of color be applied to the interiors of railway stations to produce the most beneficial effects on patrons and employees? Explain.*

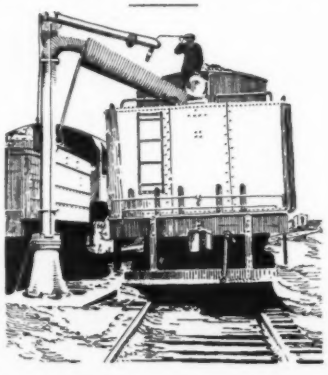
### Need Scientific Approach

By Louis Cheskin
Associate Director, Color Research Institute of America, Chicago

The extent to which the science of color can contribute to the interiors of railway stations is very great. In order to evaluate the extent of the effect of color on human beings, we must begin by taking into account the unconscious mind and emotional reactions.

If we consider only our conscious reactions, the role of color seems to be just a superficial one. We must realize that only a fraction of all of our actions and reactions is conscious and that most of our feelings and stimuli remain sensations and never reach the point of becoming complete conceptions or even conscious perceptions. Therefore, in order to grasp the full significance of color influence on people's emotions, we must deal with the unconscious aspects, placing considerable emphasis on them, and not deal with the conscious aspects of color alone.

Investigation has demonstrated that pure spectrum hues have a physiological and psychological relationship to us. Color harmony, we have learned, is not an acquired "sense of taste" or a development of an "aesthetic sense," but is a physiological phenomenon. It is also important to be aware that color harmony is an element of physics and an aspect of universal law. In fact, it embraces and characterizes the relationship between matter and light (energy), as is demonstrated by the fact that the primary components of light are the exact complements to the primary components of pigment (matter). Color harmonies, therefore, should not be subjectively chosen but should, on the other hand, be derived carefully, through scientific processes.



Investigation under controlled conditions has demonstrated that specific spectrum hues have direct psychological effect on human beings. For example, colors of the red family produce sensations of warmth; colors of the blue family create sensations of coolness. But we must keep in mind that the warmth and coolness are psychological sensations received through optical experiences and are not susceptible to thermostatic measurements.

In addition to the physiological nature of color harmony and the psychological aspects of specific pure hues, we must recognize that the values (intensity, lightness and darkness) of colors are also optical and psychological factors. Value is an optical element—first, because it affects our vision in the amount of white light it reflects; second, because it creates moods. Therefore, the value of color is also a determining factor whether a color has a favorable or unfavorable effect. The following example will serve to illustrate the effect of reflection of color on the optical factors of lightness and darkness on the unconscious mind.

The deep color of an interior reflecting 10 per cent of the light interferes with necessary visibility, let us say, for reading a newspaper, and at the same time produces a "dungeon" effect that is very depressing. Whereas another color, reflecting 50 per cent of the light, although derived from the same hue as the first, encourages relaxation and reading. At the same time it produces an effect of freshness, freedom and exhilaration, of which the person may be completely unconscious—although reading—being primarily a conscious physiological process, may bring forth awareness that the effort required is tiring because the visibility is poor.

By using the scientific approach and making use of the favorable physiological and psychological elements inherent in specific hues, in color combinations, and in color tonal values, we can produce a favorable environment in the interiors of railway passenger stations which will have a beneficial and a satisfying effect on the patrons who use them and on the employees as well.

[A further discussion of this subject will be published in a subsequent issue.—Editor]

# PRODUCTS OF MANUFACTURERS

## New, improved equipment, materials, devices

*(For additional information on any of the products described in these columns, use postcards, page 131)*

## Weed Killer for Woody Plants

THE Ralston Purina Company, St. Louis, Mo., is introducing into the railway field a weed-killing chemical which is especially designed for use on the heavier, or woody growths of the types frequently found along railway rights-of-way. This chemical, known as Purina Weed Killer (For Woody Plants) contains, as the active ingredient, a substance known as 2,4-Dichlorophenoxyacetic acid, more familiarly referred to as 2,4-D. The commercial use of 2,4-D has heretofore been confined largely to use in compounds for eradicating plants of the broad-leaf variety on lawns. Normally, however, the compounds of this type are not highly toxic to the stronger, more woody plants.

In the Purina Weed Killer (For Woody Plants) the toxic chemical is in the form of an ester of 2,4-D, which is said to render it especially effective for eradicating woody plants and shrubs of many varieties and weeds having "waxy" leaves; also for killing the lighter types of growth. The chemical is supplied in a concentrated liquid form, which is emulsifiable and mixes readily in water, and is applied by spraying.

The manufacturer recommends the killer be used in a definite program or series of treatments for the most satisfactory results. Such a program would begin in the spring of the year, perhaps in May, when many plants are just beginning their seasonal growth and would be most susceptible to the toxic effect of the chemical. The first application would consist of a solution containing two quarts of the concentrated chemical to 100 gal. of water. A second application would be made in early fall of the same year to kill those weeds which withstood the first application and to attack those which were not in leaf earlier in the year. A third application, to be made in the spring of the following year, would complete the initial treatment, or program, to the extent that the few plants which remain could be removed by a relatively small amount of cutting. According to the manufacturer, the concentration of chemical used in the second and third applications may be reduced to 1½ qt. of chemical to 100 gal. of water.

The effect of Purina Weed Killer when sprayed on a plant is to attack it at the leaf and spread to all parts of the plant, including the root structure. The killing action is manifested by a marked curling and twisting of the stem and leaves and by the development of abnormalities in the roots. This action, while not rapid, is reported as being extremely thorough and, in most cases, to result in the death and disintegration of the plant, usually within one to two months.

Extensive test applications of the chemical have been made on two roads in the South. In one test, in the spring of 1947, a concentration of two quarts of weed killer to 100 gal. of water was sprayed over the right-of-way at the rate of 90 gal. of mixture per acre. After three weeks, a visual inspection was made of the area and it was estimated that of 22 types of plants listed at this location, 12 varieties were killed to the extent of 90 to 100 per cent and the 10 other varieties were 50 per cent killed. Among the plants that were seriously affected by the chemical were elm, sumac, willow, cottonwood, elderberry, trumpet vine, poison ivy, beech, Virginia creeper, wild aster, sycamore, and wild parsnip. Other plants, not as seriously affected, but definitely weakened, included ash, milkweed, maple, mulberry and blackberry.

A second application of the chemical was made in the same area, in October. This time, 1½ qt. of the chemical was used in 100 gal. of mixture containing 3 gal. of miscible oil and 100 gal. of water. The results of this test were not evaluated because the natural loss of foliage at that season would have made an accurate evaluation impossible. It is expected, however, that the effect will be apparent during the coming spring.

Applications of the Weed Killer in the tests were made by means of spray machines manufactured by the Ralston Purina Company. These machines, which are equipped with tanks of 105 gal. capacity, a gasoline engine for driving a mechanical agitator and a hydraulic pump capable of pumping

**Spraying the Weed Killer Over the Right of Way**

4 gal. per min. at pressures up to 400 lb. per sq. in., were mounted on push cars. On one road, the equipment was hauled by a self-propelled weed burner, the tanks of which were used as reservoirs for the necessary water supply. The spray was directed onto the plant by men using single, double and multiple-nozzle sprayheads at the ends of hose lines.

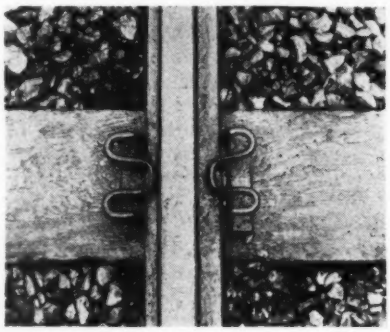
## Anchor Spike

H. T. KENNEDY & CO., New York, is introducing into this country the McBeth Anchor Spike, developed for use on the British railroads as a result of their increasing use of T-section rail in place of the "bullhead" section formerly standard in that country. At present the new spike is available in this country in limited quantities.

This spike is made in several variations from a single piece of oil-tempered steel, 9/16 in. in diameter. In one type the metal is bent in such a way as to form two legs of equal length with a U-shaped loop between the legs extending downward at an angle from the top of the legs. In another the loop forms the letter "W", with the center point bent downward. Variations from these designs may be had to meet special conditions.

To install this spike, the legs are driven through holes in the tie plate until the end of the loop, or toe, makes contact with the base of the rail. A sledge, held with the flat side down, is suggested by the manufacturer as being suitable for this driving operation. Withdrawal of the spike from the tie requires the use of a special tool, consisting of a bar with a special fitting at one end. The fitting is formed to fit over the head of the rail and has a hook to engage the loop of the spike. An upward lever action raises the spike without distortion.

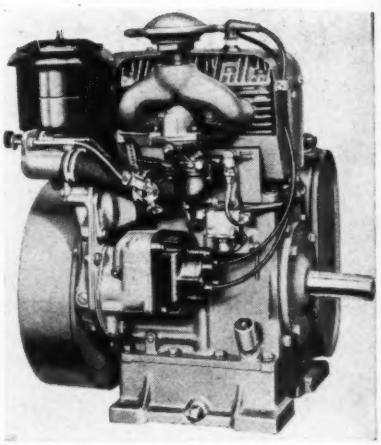
The manufacturer claims that the McBeth spike holds the rail against creepage. The two-leg construction is said to prevent it from twisting in the tie, so that the full creep load is transmitted directly to the ballast. The legs of the spike, being round in section, fit snugly into pre-drilled holes, and it is said that the fit is sufficiently tight that water cannot enter the tie. Further, it is said, the two-leg construction causes the spike to act as a staple to hold together the halves of a tie if they should have a tendency to split while in service.



Left — Close-up Showing How One Type of McBeth Spike Grips the Base of the Rail. Above—Illustrating Another Type of the McBeth Spike

## Wisconsin Engines

THE Wisconsin Motor Corporation, Milwaukee, Wis., has added two new models, designated as Models TE and TF, to its line of two-cylinder, four-cycle, air-cooled engines. The Model TE, operated at 1600 to 2600 r.p.m., is rated at 8.3 hp. to 11.2 hp., while the Model TF, at the same speeds, is rated at 9.9 hp. to 13.3 hp. The new engines are available in two mountings—a standard engine with side-mounted fuel tank, weighing 220 lb., or as a housed power unit weighing 255 lb. A clutch take-off assembly or a clutch-reduction assembly is available if desired.



One of the New Wisconsin Two-Cylinder, Four-Cycle Air-Cooled Engines

These engines are each cooled from a large fan which is cast in the fly wheel. The fan is said to force a strong blast of air across and around the cylinders and heads; it is reported that efficient cooling is obtained even in extremely high temperatures.

The new engines embody the same basic design and construction features that are characteristic of all Wisconsin air-cooled engines, such as Timken tapered roller bearings at both ends of the crank shaft, a weather-sealed, high-tension, outside magneto equipped with impulse couplings for quick starting, honed cylinders, pump lubrication with individual oil streams to each rod, a built-in centrifugal flyball governor, and a ¾-in. float-feed type carburetor. The engines are regularly furnished to operate on gasoline but can be furnished for use with other fuels.

## Power Scythe

JARI Products, Inc., Minneapolis, Minn., is introducing into the railway field the Jari Power Scythe, a lightweight unit which is reported to be highly effective for mowing tall grasses, weeds and light brush. This unit is mounted on a frame of the wheelbarrow type, with two heavy-duty wheels set close together for increased stability. The power plant, a four-cycle 1½-hp. gasoline engine, is mounted directly behind the wheels, while the sickle bar, 36 in. long, is supported on a forward extension of the frame in front of the wheels at ground level. Two belt drives, operating from the power take-off of the engine, impart power to the wheels for traveling, and to a drive shaft which, in turn, operates a reciprocating cutting blade in the sickle bar.

*(For additional information on any of the products described on this page, use postcards, page 131)*

Motion of the power scythe is controlled by a clutch handle mounted near the hand grips of the mower within easy reach of the operator. A sturdy metal fender, streamlined to facilitate moving through heavy growth, covers all moving parts.

Other features claimed for the scythe include an all-welded frame for longer life, a weight of only 145 lb., easy operation, a fuel consumption of only 5 qt. of gasoline per day, and simplified lubrication. It is reported that one man using this machine can cut as much as 12 miles of thickly-grown fence row in an eight-hour day.

# New Book

## Welding Symbols

Standard Welding Symbols and Rules for Their Use. 70 pages. Illustrated. Published by The American Welding Society, 33 W. Thirty-ninth street, New York. Bound in paper. Price 50 cents.

WITH the ever-increasing use of welding and with many new developments in the field, designers and welders have been confronted with the problem of using new processes without access to a standard set of symbols that is adaptable to every process now in use. To avoid a misunderstanding of the designer's intentions, it is essential that a flexible yet precise set of symbols be available to every person concerned.

This book, prepared by the Committee on Symbols of the American Welding Society, provides rules which will meet the needs of management, the designer, and the shop man. Earlier editions of Welding Symbols were concerned only with gas, arc and resistance welding. The new publication, however, covers 34 welding processes now in use in various industries throughout the country. The new edition should meet the needs of industry in a satisfactory manner since the personnel of the Committee on Symbols represents every fabricating industry using welding as a production tool.

The text of the book has been revised so as to present a step-by-step presentation in lecture-type form. Other changes include a means of indicating welds having root penetration, the dropping of the confusing terms "near side" and "far side" from the nomenclature, the addition of a number of illustrations showing clearly the various applications of each symbol, and a chart providing a ready reference for summarizing the use of the welding symbols.

# What Our Readers Think

## On Cost Accounting

Chicago, Ill.

TO THE EDITOR:

The article in the November, 1947, issue of *Railway Engineering and Maintenance* by Mr. S. R. Hursh, assistant chief engineer in maintenance, Pennsylvania, under the title, "Is Greater Efficiency Possible?" is very much worth while and emphasizes the need of cost control methods, about which there is much interest shown but little action taken.

It has been generally recognized that determination of whether or not the cost of maintenance and/or construction projects are within reasonable bounds depends on:

(a) Subjective thinking or intuitive judgment.

(b) Comparison with some pre-established standard, which by judgment fits the work.

Method (a) is common practice but, unfortunately, furnishes little control. It is post-mortem and puts a premium on the ingenuity of those responsible for the work to explain away unusual and out-of-line expenses not measurable by any available yardstick. It permits the practice of burying extraneous charges of an abnormal nature and is adverse to proper accounting procedures. Most important, it prevents the establishment of standards of unit cost, which constitute the only sound basis of comparison of one project, division, district or geographical subdivision with another. etc.

Committees of the American Railway Engineering Association have studied this problem and are still studying it. Some reports and recommendations have resulted, of which the so-called Blair Report (AREA Proceeding Vol. 47, p. 273) is a sample. However, few roads have seen fit to put in effect the principles established in such a report. Notable exceptions are the Denver & Rio Grande Western and the Chesapeake & Ohio.

Acceptance of cost finding and evaluation in railroad work has been retarded for the following reasons:

(a) The system of accounts prescribed by the Interstate Commerce Commission is not a true cost accounting system. With certain exceptions the costs recorded in the accounts are contaminated—mixed with extraneous charges which must not be included if unit costs are needed. Where the costs are unmixed it is seldom possible to establish a unit of work small enough to be significant for the purpose of control. The I.C.C. accounting system is designed, as is any general system of accounts, to show by yearly periods the financial results as a whole; to give the end result. The published figures by primary accounts are in most cases of little statistical value in the study of the cost of any definite maintenance operation.

(b) The establishment of a cost-finding and cost-control system requires a highly trained organization of cost engineers and accountants. Moreover, such a system is worthless unless it is made to work by zeal, enthusiasm, and whole-hearted cooperation on the part of a management. The latter may be difficult to obtain because matters have never been handled that way, and there exists the widespread prejudice that nothing is to be gained.

(c) There is as yet substantial disagreement among engineers and accountants studying this problem on the question of what units and standards are desirable. Even such a fundamental unit as the equated mile of track offers controversy. Many feel that the Yager formula is obsolete and should be revised, but are not yet in agreement as to how to develop a better substitute. Observational methods require a very large expenditure of time and effort. Modern statistical methods are as yet little understood and are viewed with suspicion.

A railroad is one of the best examples of an integrated industry. It not only manufactures its product—transportation—but also manufactures substantially all of its plant, tools, equipment, etc., needed to produce the commodity. Industry in general has gone all-out for cost analysis and control. Without this part of its organization such industries as United States Steel, Ford, General Motors, General Electric, and a host of others would have folded up under intense competition. On the other hand, railroads have been a monopoly, and monopoly thinking governs many railroad practices, but competition and future economic conditions may force the adoption of practices that have proved their value in other industries.

C. C. HAIRE
Valuation Engineer
Illinois Central

# THE MONTH'S NEWS

## Happenings among railway men— the associations—the suppliers

## Changes in Railway Personnel

### General

**G. W. Svoboda,** roadmaster on the Wilmington district of the Atlantic Coast Line, at Wilmington, N. C., has been appointed assistant trainmaster on the Charleston district.

In connection with the reorganization of the Chicago, Rock Island & Pacific, which on January 1 emerged from 14 years of trusteeship, **W. H. Hillis,** operating officer since 1942, has been elected vice-president—operations of the reorganized company, with headquarters as before at Chicago.

**W. K. Weaver, Jr.,** assistant division engineer on the Chesapeake & Ohio, with headquarters at Covington, Ky., has been promoted to assistant trainmaster on the Toledo division, with headquarters at Columbus, Ohio.

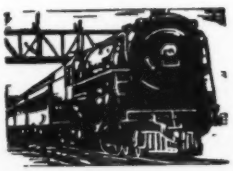
**G. A. Sargent,** supervisor of track on the Pittsburgh division of the Pennsylvania, with headquarters at Cresson, Pa., has been promoted to assistant trainmaster on the Eastern division, with headquarters at Canton, Ohio. **R. E. Blosser,** supervisor of track on the Maryland division, with headquarters at Washington, D.C., has been promoted to assistant trainmaster on the Williamsport division. **J. J. Maher,** supervisor of track on the Maryland division, with headquarters at Baltimore, Md., has been promoted to assistant trainmaster on the Philadelphia Terminal Division, with headquarters at Philadelphia, Pa. **A. E. Myles,** supervisor of track on the Columbus division, with headquarters at Dayton, Ohio, has been promoted to assistant trainmaster on the Indianapolis division at Indianapolis, Ind.

**Alfred E. Perlman,** chief engineer of the Denver & Rio Grande Western, has been promoted to general manager, with headquarters as before at Denver, Colo. **W. C. Jones,** assistant to the general manager, and formerly chief engineer of the Denver & Salt Lake (now part of the D.&R.G.W.), has been appointed assistant to the executive vice-president.

Mr. Perlman was born at St. Paul, Minn., on November 22, 1902, and was graduated from the Massachusetts Institute of Technology in 1923. He also took a course in railway transportation at the Harvard School of Business Administration during the summer of 1930. He first entered railway service in 1918, with the Minneapolis, St. Paul & Sault Ste. Marie, and served with various railroads during summer vacations from school. Following his graduation, Mr. Perlman entered the service of the Northern Pacific in 1923 as a construction draftsman. In 1924 he

**Alfred E. Perlman**

became an extra-gang laborer and in 1925 he was appointed inspector of icing facilities at St. Paul. In 1926 Mr. Perlman was sent to Glendive, Mont., as assistant supervisor of bridges and buildings, and in November of the following year he was appointed roadmaster, with headquarters at Carrington, N.D., being transferred to Sandpoint, Idaho, in 1929, and to Staples, Minn., in 1930. In October, 1934, he was assigned to special duties in the office of the vice-president in charge of operations, and in the following month he was loaned to the Railroad division of the Reconstruction Finance Corporation, where he made studies of maintenance conditions on lines making applications for loans. In 1935 he was appointed assistant engineer maintenance of way of the Chicago, Burlington & Quincy, with headquarters at Chicago, and in 1936, he went with the D.&R.G.W. as engineer maintenance of way, with headquarters at Denver. On May 1, 1944, Mr. Perlman became chief engineer and held that position until his recent promotion.



**Arthur B. Gloster,** superintendent of the Cumberland Valley division of the Louisville & Nashville, with headquarters at Middlesboro, Ky., and an engineer by training and experience, has retired after 48 years of service with that road. Mr. Gloster was born at LaGrange, Tenn., and was graduated from the University of Tennessee in 1898 with a degree in engineering. He entered the service of the L. & N. in 1899 as a levelman on location. In 1907 he was appointed assistant engineer on the Cumberland Valley division, and in 1914 was advanced to roadmaster on the Atlanta division. He returned to the Cumberland Valley division in 1918 as roadmaster, and was appointed superintendent of that division in 1926, which position he held until his recent retirement.

### Engineering

**Wilson Morrow,** division engineer on the Baltimore & Ohio, at Baltimore, Md., has been promoted to engineer maintenance of way, with headquarters as before at Baltimore, succeeding **H. L. Exley,** transferred.

**G. C. Lindsey,** assistant engineer on the New York Central, at Cleveland, Ohio, has been promoted to assistant engineer of structures with the same headquarters, succeeding **A. M. Westenhoff,** who has been promoted to the newly-created position of engineer of construction, with headquarters at Chicago.

**W. R. Rhodes,** assistant engineer on the Missouri Pacific, with headquarters at St. Louis, Mo., has been promoted to assistant division engineer, with the same headquarters. **R. J. Bruce, Jr.,** assistant engineer at Wichita, Kan., has been transferred to St. Louis, succeeding Mr. Rhodes. **C. T. Fielding,** instrumentman at Wichita, has been promoted to assistant engineer there. **L. Winship,** assistant engineer at St. Louis, has retired.

**C. R. Riley,** assistant division engineer on the Baltimore & Ohio, at Baltimore, Md., has been promoted to division engineer on the Baltimore division, West End, with headquarters as before at Baltimore, to succeed **George S. Crites,** whose retirement was reported in the September, 1947, issue. Mr. Riley began his career with the Baltimore & Ohio in the signal department at Baltimore, on June 1, 1929. He

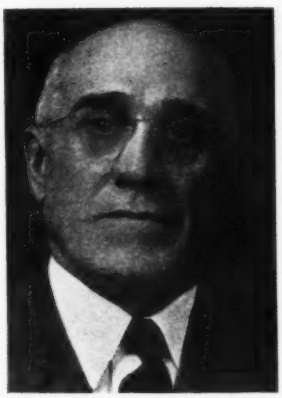
was transferred to the engineering department in 1939, serving in various positions at Pittsburgh, Pa., and Baltimore, until his appointment as assistant division engineer on the Baltimore division in December, 1943.

**T. A. Archer,** assistant engineer on the Chesapeake & Ohio, at Huntington, W. Va., has been appointed assistant cost engineer, with headquarters at St. Albans, W. Va., to succeed **R. B. Hayslip,** whose promotion to supervisor of track there is reported elsewhere in these columns.

**H. T. Livingston,** engineer of bridges of the Chicago, Rock Island & Pacific, has been appointed chief engineer, maintenance of way and structures, of the reorganized company, with headquarters as before at Chicago. **W. E. Heimerdinger,** assistant chief engineer, has been appointed engineer of bridges. **F. W. Thompson** continues as chief engineer.

**S. Thorvaldson** has been appointed chief engineer of the Lake Superior & Ishpeming, succeeding **E. G. Day,** who has retired at his own request. Mr. Thorvaldson was terminal engineer of the Wabash at Detroit, Mich., and prior thereto for short periods of time was employed by the Pennsylvania and the Pere Marquette. Mr. Day, prior to his association with the L. S. & I., was division engineer of the Chicago & North Western at Escanaba, Mich.

**L. F. Racine,** formerly division engineer on the Union Pacific, with headquarters



L. F. Racine

at Salt Lake City, Utah, has been appointed chief engineer of the Chicago, Indianapolis & Louisville, with headquarters at LaFayette, Ind. He succeeds **J. C. Bussey,** who has retired.

Mr. Racine was born at Des Moines, Iowa, on August 29, 1890, and received his higher education at the University of Nevada. He entered railroad service in May, 1915, as an instrumentman on the Union Pacific at Pocatello, Idaho, subsequently serving as assistant engineer and assistant division engineer at that point. In 1929 he was appointed roadmaster, with headquarters at Ashton, Idaho, and later served in the same capacity at Glenns Ferry until his promotion to general roadmaster in 1938, with headquarters at Portland, Ore. In 1940 he was appointed division engineer, with the same headquarters, and in 1941 was transferred to Salt Lake City, where he remained until his recent appointment as chief engineer of the Monon.

**Kenneth L. Moriarty,** assistant chief engineer of the Denver & Rio Grande Western, has been promoted to chief engineer, with headquarters as before at Denver, Colo., succeeding **A. E. Perlman,** whose promotion to general manager is

Kenneth L. Moriarty

noted elsewhere in these columns.

Mr. Moriarty was born on November 18, 1896, at Joliet, Ill. He began his railroad career in the engineering department of the Chicago Great Western in 1917, and subsequently advanced through various positions to that of assistant engineer in the maintenance of way department. He joined the Rio Grande in 1924 as division engineer at Gunnison, Colo., and later held that post at other points on the railroad. He was appointed roadmaster at Green River, Utah, in 1933 and trainmaster at Glenwood Springs, Colo., in 1935. Mr. Moriarty's next position was that of assistant superintendent at Grand Junction, Colo., which he held until his promotion to division superintendent at that point in 1939. He was transferred to Salt Lake City, Utah, in 1943, and was promoted to assistant chief engineer at Denver on February 1, 1946. Mr. Moriarty was serving in the latter post at the time of his recent promotion to chief engineer.

**W. O. Houston,** whose retirement as district engineer of the Michigan Central at Detroit, Mich., was reported in the January issue, was born at Burlington, Kan., and received his higher education at the University of Michigan, from which he received a degree in Civil Engineering in 1904. Mr. Houston worked during summer vacation periods in the engineering departments of the Ann Arbor and the M. C., and in 1904 he became instrumentman for the latter road. From 1905 to 1909, he held positions as transitman, bridge inspector, resident engineer and division engineer for the New Orleans Great Northern (now part of the Gulf, Mobile & Ohio). Later, he held posiitions successively with the M. C. as assistant engineer at Windsor, Ont., and St. Thomas, construction engineer at Detroit, and division engineer at St. Thomas and Jackson, Mich. In 1939 he was appointed district engineer at Detroit, the position he held until his recent retirement.

**F. C. Cunningham,** assistant division engineer on the Chesapeake & Ohio, at Russell, Ky., has been promoted to division engineer on the Chicago division, with headquarters at Peru, Ind., succeeding **R. C. Watkins,** who has been transferred to the Hocking division, with headquarters at Columbus, Ohio, where he succeeds **M. J. Hubbard,** whose promotion to general supervisor of bridges and buildings is reported elsewhere in these columns. **L. B. Hewlett,** assistant division engineer on the Ashland division, at Ashland, Ky., has been transferred to Russell, succeeding Mr. Cunningham, and **K. E. Stephenson,** supervisor of track at Huntington, W. Va., has been promoted to assistant division engineer, to succeed Mr. Hewlett at Ashland. **J. H. Barksdale,** supervisor of track at St. Albans, W. Va., has been promoted to assistant division engineer, with headquarters at Covington, Ky., to succeed **W. K. Weaver, Jr.,** whose promotion to assistant trainmaster is noted elsewhere in these columns.

**F. W. Creedle,** division engineer of the Wisconsin division of the Chicago and North Western, with headquarters at Chicago, has been promoted to assistant engineer maintenance of way, with headquarters, as before, at Chicago, succeeding **C. E. Miller,** who retired February 1. **W. H. Huffman,** division engineer of the Peninsula division, with headquarters at Escanaba, Mich., has been transferred to the Wisconsin division, at Chicago to succeed Mr. Creedle. **B. G. Packard,** acting division engineer of the Black Hills, division, at Chadron, Neb., succeeds Mr. Hoffman as division engineer of the Peninsula division. **William Wilbur,** assistant engineer of the Galena division, with headquarters at Chicago, becomes acting division engineer of the Black Hills division at Chadron.

## Track

**Alexander Salerno,** extra gang foreman on the Chicago & Western Indiana, has been appointed assistant roadmaster, with headquarters at Chicago.

**Rex Price** has been appointed assistant roadmaster at El Reno, Okla., to replace **R. P. Scott,** who was made roadmaster at El Reno, to replace **G. W. Runnells,** resigned.

**D. C. Close,** acting roadmaster on the Chicago, Rock Island & Pacific, at Enid, Okla., has been appointed roadmaster at El Dorado, Ark., in place of **G. M. Brum,** who was transferred to Enid in place of **J. S. Walpole,** who has resigned.

**E. E. Nichols,** has been appointed supervisor of track of the Newport News—Norfolk Terminal division of the Chesapeake & Ohio, with headquarters at Newport News, Va., to succeed **G. R. Smith** who has retired.

**Michael J. Quigley** has been appointed track supervisor, District No. 1, on the Boston & Maine, with headquarters at Boston, Mass., to replace **J. Frank Talbot,** whose death is reported elsewhere in these

# Your Guide to the Greatest Value in Gasoline Engines

AIR COOLED POWER

The record for dependable performance... made by more than 3¼ million Briggs & Stratton engines built during 28 years of *continuous production*... stands unequalled. No other manufacturer has built so many 4-cycle air-cooled gasoline engines, or has had such long experience in building them. This experience, and the proven ability to deliver maximum performance year after year—maintain Briggs & Stratton engines *as the foremost power value* for industrial equipment, farm machinery and appliances.

**BRIGGS & STRATTON CORPORATION, MILWAUKEE 1, WIS., U. S. A.**


# Association News

## Metropolitan Maintenance of Way Club

S. R. Hursh, assistant chief engineer, maintenance, Pennsylvania, will be the speaker at the next meeting of the club, February 26. The program will deal with maintenance of way work equipment. This meeting will be held in the Skyline room of the Hotel Sheraton and will be preceded by dinner at 6:30 p.m. No meeting of the club was held in January.

## National Railway Appliances Association

Plans for the annual exhibit of the association, March 15-18, in Chicago, in connection with the annual meeting of the American Railway Engineering Association—together with a list of those companies that have signed contracts to date to exhibit—are pointed out in considerable detail in the feature pages of this issue under the head Suppliers Plan Record Exhibit During A.R.E.A. Meeting.

## Wood Preservers' Association

The Executive committee of the association met in Chicago, January 23, to consummate details for the annual convention of the association to be held in St. Paul,

(*Continued on page* 174)

## Meetings and Conventions

**American Railway Bridge and Building Association**—Annual meeting, September 20-22, 1948, Hotel Stevens, Chicago. Elise LaChance, secretary, 431 S. Dearborn street, Chicago 5.

**American Railway Engineering Association**—Annual Meeting, March 16-18, 1948, Chicago. W. S. Lacher, secretary, 59 E. Van Buren street, Chicago 5.

**American Wood-Preservers' Association**—Annual meeting, April 27-29, 1948, St. Paul, Minn. H. L. Dawson, secretary-treasurer, 1429 Eye street, N.W., Washington 5, D. C.

**Bridge and Building Supply Men's Association**—Joint exhibit with Track Supply Association, September 20-22, 1948, Hotel Stevens, Chicago, during concurrent conventions of American Railway Bridge and Building Association and Roadmasters' Association. E. C. Gunther, secretary, 122 S. Michigan avenue, Chicago 3.

**Maintenance of Way Club of Chicago**—Next meeting, February 23, 1948. C. R. Knowles, secretary-treasurer, 105 W. Adams street, Chicago 3.

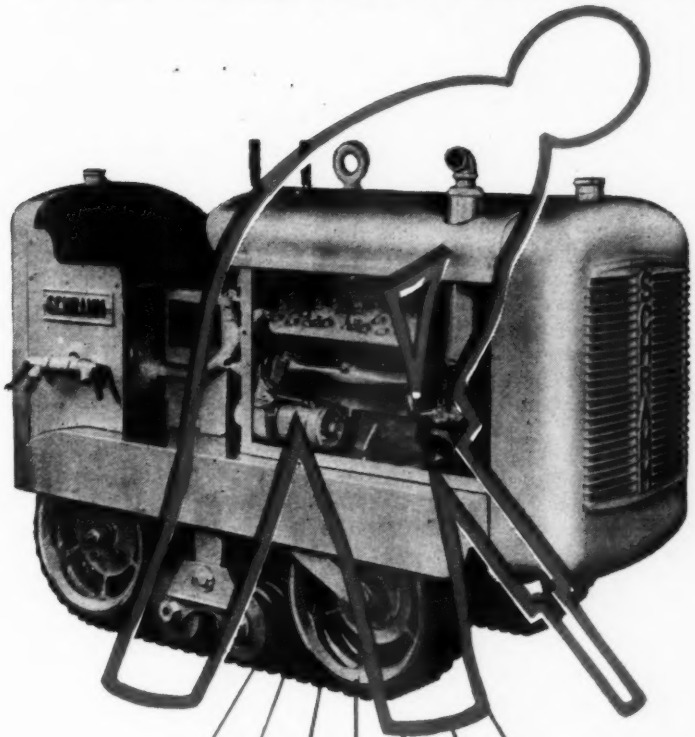
**Metropolitan Maintenance of Way Club**—Next meeting, February 26, Hotel Sheraton, New York. J. S. Vreeland, secretary, 30 Church street, New York.

**National Railway Appliances Association**—Thirty-third annual exhibit, Chicago, March 15-18, 1948, in connection with A.R.E.A. convention. R. B. Fisher, secretary, 1 No. LaSalle street, Chicago 4.

**Roadmasters' and Maintenance of Way Association of America**—Annual meeting, September 20-22, 1948, Hotel Stevens, Chicago. Elise LaChance, secretary, 431 S. Dearborn street, Chicago 5.

**Track Supply Association**—Joint exhibit with Bridge and Building Supply Men's Association, September 20-22, 1948, Hotel Stevens, Chicago, during concurrent conventions of Roadmasters' Association and American Railway Bridge and Building Association. Lewis Thomas, secretary, 59 E. Van Buren street, Chicago 5.

# SCHRAMM MODEL 60 CRAWLER AIR COMPRESSOR



## *It goes where the work is*

In railroad maintenance, the swing is to off-track compressors in small capacity units. Flexibility is the big reason, for they make it easy to tailor the equipment for the job at hand, whether it be out-of-face or spot tamping. And trackmen say that the Schramm Model 60 is the handiest compressor that ever climbed a fill. Riding on its crawler treads, it goes merrily along, even to places difficult to reach. The result is that you will find lots of uses for it, even when there is no ballast that needs tamping.

We want to tell you more about the Schramm Model 60 Crawler—its unique power plant, its compactness, and its adaptability to other jobs besides supplying compressed air. Get your copy of bulletin FC 48 from the Railway Sales Division, Schramm, Inc., "The Compressor People," West Chester, Pennsylvania.

## Perfect for every air use

# POAGE

## PRESENTS

# A NEW Water and Oil Column for Servicing Diesel Locomotives

**The Poage Diesel Water and Oil Columns are designed for one man operation. The Poage Diesel Water Column is constructed to drain Vertical Riser into pit. This obviates necessity of constructing a costly Frost Box. The Valve of the Diesel Water Column is designed to eliminate water hammer that might be set up in the supply main.**

**The Poage Diesel Oil Column is constructed to include steam lines around Vertical Riser so as to insure a constant temperature of the oil in the Vertical Riser during the winter months.**

**You are cordially invited to inspect these Columns at our BOOTH No. 104, National Railway Appliance Association Exhibit, March 15th through 18th, 1948.**

**We will also exhibit models of the McGarry Pollution-proof Non-freezing Hydrant for servicing Passenger Cars.**

**The McGarry Hydrant is designed so that all potable water in Riser Pipe will drain into Reservoir after Hydrant has been shut off. This drained water is then ejected from the Hydrant through an air gap. This method of operation insures an operating Hydrant in sub-zero weather.**

**Manufactured and Sold Exclusively by**

## RAILROAD PRODUCTS COMPANY

**2833 Spring Grove Avenue, Cincinnati 25, Ohio**


(*Continued from page 172*)

Minn., April 27-29. Special-train accommodations are being planned at least from Chicago to St. Paul, information concerning which will be sent to members as early as possible. Work on the 1947 proceedings has been completed, and it is expected that copies will be mailed to members shortly.

### Track Supply Association; B. & B. Supply Men's Association

The joint exhibit of these associations, in connection with the concurrent annual meetings of the Roadmasters' Association and the American Railway Bridge & Building Association, will be held at the Hotel Stevens, Chicago, beginning Monday, September 20, instead of Tuesday, September 21, and will close on Wednesday instead of Thursday. These date changes have been made to correspond with the plans of the two railroad associations to advance their conventions one day.

Exhibit contract forms will not be sent out to members and other prospective exhibitors until after March, but those desiring advance information should address Lewis Thomas, director of exhibits, 59 E. Van Buren St., Chicago.

### Roadmasters' Association

Looking to the annual convention of the association in Chicago, September 20-22, all of the technical committees of the association are actively progressing their reports. The convention, as pointed out in the January issue, will this year begin on Monday and close on Wednesday, instead of the Tuesday opening and Thursday closing of previous years. Again, the meeting will be held concurrent with the annual convention of the American Railway Bridge & Building Association, and in conjunction with a joint exhibit by the Track Supply Association and the Bridge and Building Supply Men's Association. The next meeting of the Executive committee will be held in Chicago, at the Chicago Engineers' Club, March 15, the day prior to the opening of the annual meeting of the American Railway Engineering Association.

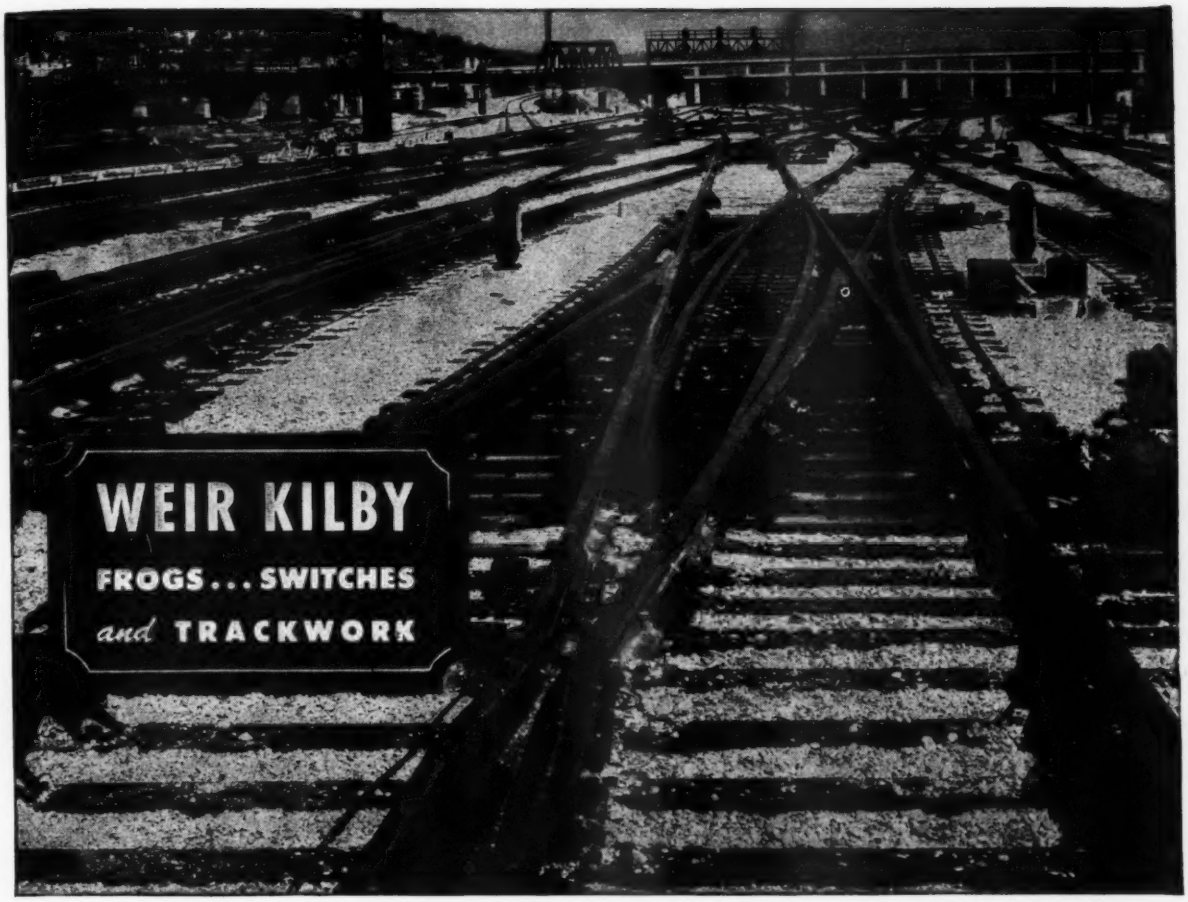
### American Railway Engineering Association

Final touches are now being made to the program of the annual convention to be held at the Palmer House, Chicago, on March 16-18. The latest of these is the announcement that Clark Hungerford, president, St. Louis-San Francisco, will be the principal speaker at the annual luncheon to be held on March 17.

Most of the standing committees have finished their work for the year with the result that only three committees met in January and none have scheduled meetings for February. The three committees holding meetings in January were those on Economics of Railway Location and Operation, which met at Washington, D. C., on January 22; Economics of Railway Labor, which met at Chicago on January 27; and Masonry, which met in New York on January 29-30.

The January Bulletin (No. 471) is now in the hands of members. This bulletin con-

(*Continued on page 176*)




**BUILT TO A.R.E.A. *or* RAILROAD SPECIFICATIONS . . . FROGS, SWITCHES, GUARD RAILS *and* CLAMPS, CROSSINGS . . . MANGANESE *and* HEAT TREATED RAIL WORK**

The products of Weir Kilby Corporation are well and favorably known by the many railroads and large industrial plants of the country.

Accumulated experience, thru the many years of gradually expanding operations, has been an important factor in the quality of our products and the cooperative relations with our numerous customers.

Having factories located at both Cincinnati and Birmingham, each carrying substantial inventories of raw materials, we are well situated to meet your varied needs.

*Weir Kilby's combination of competent engineering, modern machines and skilled operators, all work together for our customers' advantage.*

**CATALOG "H"**

**Comprises 154 pages of helpful data, replete with photos, drawings and specifications, covers every track work need. A request on your letterhead will bring your copy promptly.**

*Standard and Special Track Work for Steam Railroads Since 1882*

# WEIR KILBY CORPORATION

**CINCINNATI 12, OHIO** — **BIRMINGHAM 7, ALA.**

Successors to

**WEIR FROG CO. . . . KILBY FROG & SWITCH CO. . . . CINCINNATI FROG & SWITCH CO.**

Stop Rust

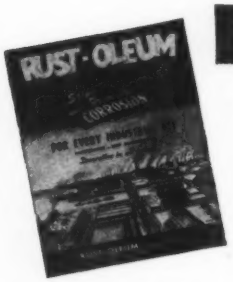
AND CUT MAINTENANCE COSTS!

RUST-OLEUM gives lasting protection

Offset rising labor costs. Trim shop maintenance expense by protecting all rustable metal with Rust-Oleum. Railroads find it invaluable for prolonging the life of rolling stock, buildings, bridges, signal equipment and other properties. RUST-OLEUM *is the most effective way to check and prevent rust.*

Rust-Oleum outlasts ordinary protective materials two to ten times—depending upon conditions under which it is used. It defies rain, snow, dampness, acids, brine, gases and other corrosive elements. *Rust-Oleum can be applied directly to any rusted surface*—after quick wirebrushing . . . It merges the remaining rust into its tough, durable, protective coating.

*Specify Rust-Oleum on new cars, locomotives and rebuilding programs — also for right-of-way equipment. Write today for catalog of recommended uses.*




THIS *Free* BOOKLET TELLS HOW

SAVES 3 WAYS . . .

★ IT CUTS PREPARATION TIME! No sand-blasting, flame cleaning or chemical "dissolvers" are necessary. Quick wirebrushing removes paint and rust scale, blisters, dirt, etc.

★ IT GOES ON FASTER! Rust-Oleum saves 25% of the time usually required for application and covers 30% more area than ordinary materials. Brush, dip or spray.

★ IT LASTS LONGER! Rust-Oleum outlasts ordinary materials two to ten times. This means maximum protection on every application—at a proportionate saving in labor and materials.

KNOW THE FACTS MAIL THIS COUPON TODAY!

RUST-OLEUM CORPORATION, 2417 Oakton St., Evanston, Ill.
Gentlemen: Please send a free copy of your Rust-Oleum catalog of railroad applications and recommended uses.

Name _____
Company _____
Address _____
City _____ State _____

☐ Also send information on R-9

RUST-OLEUM CORPORATION
2417 Oakton Street Evanston, Illinois


(*Continued from page* 174)

tains reports of the Committees on Masonry, Wood Bridges and Trestles, Clearances, Impact and Stresses, Cooperative Relations With Universities, and Records and Accounts. The February Bulletin (472), containing reports of the committees on Roadway and Ballast, Track and Rail, will be mailed to members about February 15. Included with the February issue of the A.R.E.A. News, mailed to members late in January, was a ballot for the election of officers for 1948-49.

## Maintenance of Way Club of Chicago

The next meeting of the club will be held on Monday, February 23, at Harding's restaurant in The Fair store (Adams and Dearborn streets), beginning with dinner at 6:30 p.m. The feature of this meeting will be an address by J. Lyman Loucks, sales engineer, Union Switch & Signal Company, Chicago, who will discuss The Interlocking Interests of Signal and Roadway Officers. The January 26 meeting of the club, held at Harding's At The Fair—with 182 members and guests in attendance—was addressed by L. L. Adams, assistant chief engineer, Louisville & Nashville, assisted by motion pictures and lantern slides, who described the work of rehabilitating track and structures damaged extensively along the Gulf coast by the tropical hurricane in September.

## Dougherty Takes Office As President of the A.S.C.E.

Richard E. Dougherty, vice-president of the New York Central, with headquarters at New York, was inducted as president of

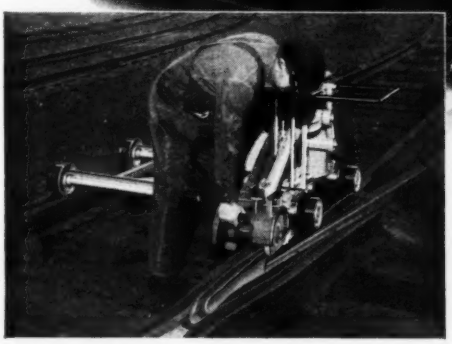
Richard E. Dougherty

the American Society of Civil Engineers at the society's annual meeting held January 21-24, inclusive, at the Hotel Commodore in New York. Mr. Dougherty has a long record of service in the engineering and executive departments of the New York Central. Entering the service of this company in 1902, he served in various subordinate positions in the engineering department until 1904, when he was appointed assistant engineer in the road's general office at New York, becoming resident engineer in the following year. He subsequently held positions successively as assistant district

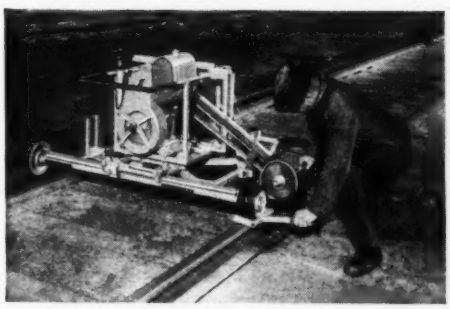
(*Continued on page* 178)

# NORDBERG FLEXIBLE ARM GRINDER

## has Speed... is Versatile



Frogs and flangeways are ground with an 8" x 1" flat wheel.



Arm is crosswise to the rail for rail end slotting with thin wheel.

- *Removes flow at switchpoints and stock rails.*
- *Grinds frogs and flangeways built up by welding.*
- *Undercuts stock rails to house switchpoints.*
- *Slots rail ends rapidly—with utmost convenience.*
- *Grooves rail for wire insert at turnouts.*

For speed and all 'round convenience and adaptability, no grinder can equal the performance of the Nordberg Flexible Arm Grinder. The grinding wheel mounted on the end of the swinging arm easily reaches all places where grinding is done on rail, switches and crossings. The rapid rate at which this grinder removes metal, its ease of handling and its many applications makes it a valuable tool for track maintenance work. For your grinding jobs, investigate the merits of the Nordberg Flexible Arm Grinder.

**NORDBERG MFG. CO.**
**MILWAUKEE 7, WISCONSIN**

## NORDBERG RAIL GRINDERS

*BUILT IN FIVE TYPES • MEET ALL RAIL GRINDING DEMANDS*

*Operated by A. P. Smith Mfg. Co., East Orange, N. J.*

# Upkeep on this magnet averaged only $5 a year

There's good reason to examine this magnet closely. It looks like new . . . lifts like new—*but isn't new!*

This 45 inch Ohio Magnet is 22 years old. It has seen continuous service in a New Jersey scrap yard since 1925. The magnet was returned to us recently for repairs to a ground in the terminal box. Disassembly was totally unnecessary. Time out of service amounted to only a few days.

Total cost was less than $100—*less than $5 a year for 22 years.*

Naturally we'd like to claim that all Ohio Magnets give the same amazing service. Varying conditions of operation, however, make that statement impossible. *From experience we can say*: Heavier construction increases Ohio Magnet life. Extra weight is distributed throughout copper coils, insulation and steel frame—for greater lifting efficiency.

An Ohio Magnet quickly pays for itself because you move scrap directly to where you want it *in one operation—in magnet - minutes instead of man-hours.* And lower maintenance cost makes an Ohio Magnet an even sounder investment. Call on Ohio: *a leader in magnetic materials handling.*

Ohio MAGNETS

*also a leading name in the small motor field*

THE OHIO ELECTRIC MFG. CO.

5916 MAURICE AVE. • CLEVELAND 4, OHIO

(*Continued from page* 176)

engineer, district engineer, designing engineer, engineering assistant to vice-president and engineering assistant to president. He became vice-president of the road on February 1, 1930.

Aside from his affiliation with the A.S.C.E., Mr. Dougherty is a member of the American Railway Engineering Association and the New York State Society of Professional Engineers and Land Surveyors. He is also a member of the Committee for the Study of Transportation, appointed by the Association of American Railroads to consider postwar problems. Since 1935 he has been chairman of the Grade Crossing committee of the A.A.R., acting for all of the railroads in cooperation with the Public Roads Administration.

## Bridge & Building Association

With work on committee reports well under way, the association is looking forward to an unusually successful convention in Chicago, September 20-22, concurrent with the annual meeting of the Roadmasters' Association and exhibits by the Bridge and Building Supply Men's Association and the Track Supply Association. Special attention is called to the fact that the convention will be held Monday through Wednesday this year, instead of Tuesday through Thursday, as in previous years. The next meeting of the Executive committee will be held in Chicago, March 16, in connection with the annual convention of the American Railway Engineering Association. Following is a list of the various technical committees and their chairmen and vice-chairmen:

No. 1—Protection to Bridges Over Navigable Streams—A. E. Bechtelheimer (chairman), br. engr. (retired), C. & N. W., Winnetka, Ill.; J. J. Winn (vice-chairman), supvr. b. & b. B. & M., Boston, Mass.; N. R. Tucker (vice-chairman), asst. div. engr., T. & N. O., Lafayette, La.

No. 2—Types of Bridges for Replacing Timber Trestles—F. M. Misch (chairman), gen. b. & b. supvr., S. P., San Francisco, Cal.; A. Bober (vice-chairman), br. engr., G. M. & O., Mobile, Ala.; J. M. Giles (vice-chairman), res. engr., M. P., St. Louis, Mo.

No. 3—Enlarging and Relining Tunnels for Present-Day Traffic—C. M. Eichenlaub (chairman), res. engr., S. D. & A. E., San Diego, Cal.; W. R. Harman (vice-chairman), supvr., b. & b., S. P., San Francisco, Cal.; R. W. Humphreys (vice-chairman), asst. b. & b. supvr., N. P., Missoula, Mont.

No. 4—Recent Developments in Fuel Oil Storage and Servicing Facilities for Diesel and Oil-Burning Locomotives—H. E. Michael (chairman) assoc. ed., *Railway Engineering and Maintenance*, Chicago; W. D. Gibson (vice-chairman), w. s. engr., C. B. & Q., Chicago; R. L. Fox (vice-chairman), div. engr., Southern, Alexandria, Va.

No. 5—Sanitary Facilities and Appurtenances for Railway Buildings—L. C. Winkelhaus (chairman), arch. engr., C. & N. W., Chicago; L. S. Marriott (vice-chairman), gen. bldg. insp., I. C., Chicago.

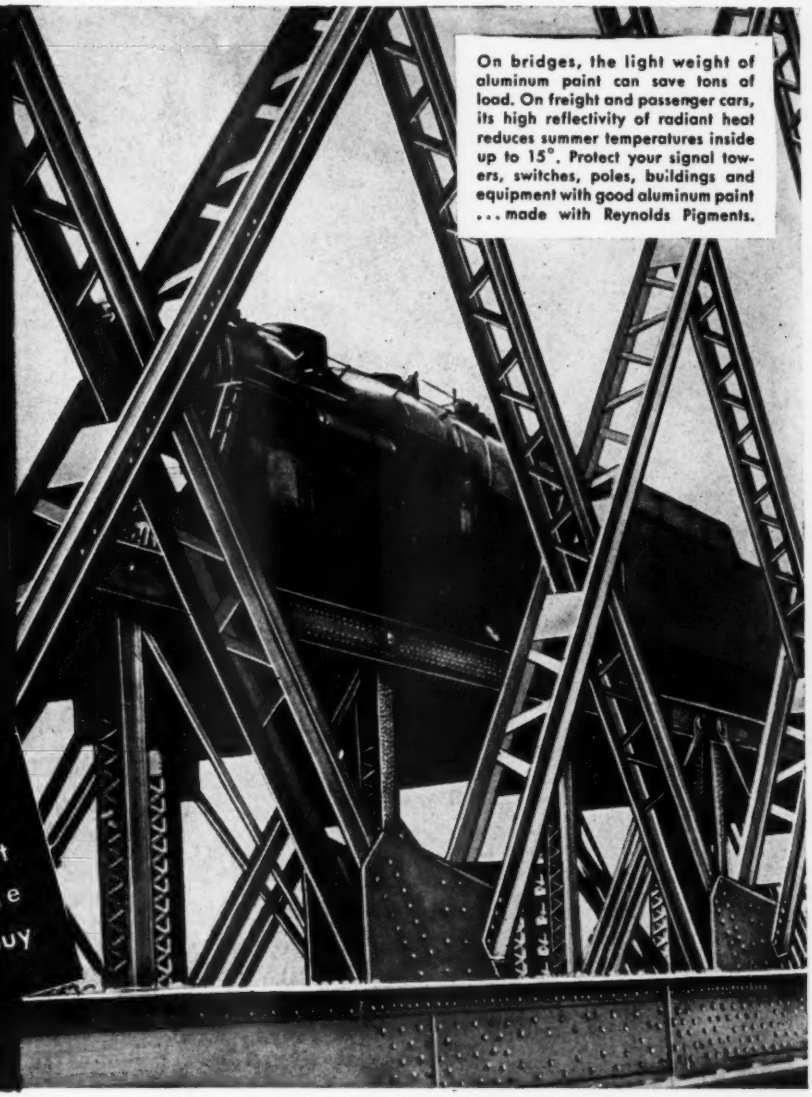
No. 6—Eliminating Waste of Water—E. R. Schlaf (chairman), asst. to supt. w. s., I. C., Chicago; J. A. Jorlett (vice-chairman), mast. carp., P. R. R., Pittsburgh, Pa.; R. H. Morrison (vice-chairman), prin. asst. engr., B. & A., Houlton, Me.

No. 7—Good Housekeeping to Promote Safety and Fire Prevention—H. E. Skinner (chairman), supt. scales & wk. equip., E. J. & E., Joliet, Ill.; F. R. Spofford (vice-chairman), asst. div. engr., B. & M., Dover, N. H.; E. H. Blewer (vice-chairman), supvr. safety engrg., N. Y. C., New York.

No. 8—Housing Bridge and Building Employees—W. W. Caines (chairman), asst. supvr. b. & b., C. & O., Huntington, W. Va.; J. J. Healey (vice-chairman), asst. supvr. b. & b., B. & M., Boston, Mass.; H. A. Hunt (vice-chairman), asst. div. engr., T. & N. O., El Paso, Tex.

(*Please turn to page* 180)

# PROTECT IT WITH GOOD ALUMINUM PAINT



On bridges, the light weight of aluminum paint can save tons of load. On freight and passenger cars, its high reflectivity of radiant heat reduces summer temperatures inside up to 15°. Protect your signal towers, switches, poles, buildings and equipment with good aluminum paint ... made with Reynolds Pigments.

✻ Here are 2 checks to make sure you get top quality in the aluminum paint you buy

THERE's no better, longer lasting or more economical "lifeguard" for your property than good aluminum paint. It protects metal from rust and corrosion... brightens and beautifies all it covers ...assures lower maintenance costs.

Your first check on the quality of aluminum paint is to see that it is made by a reliable manufacturer; your second is to ask whose pigment is used. If it's Reynolds pigment, that's the very foundation of quality.

Reynolds has been leader in aluminum pigment production for a quarter-century. No one knows better how to produce pure pigments... of proper characteristics for every use. And the long association of Reynolds with the paint industry... the close collaboration between paint chemists and Reynolds technicians... is additional assurance of the best in aluminum paint.

When you buy a good brand of aluminum paint, chances are it will be made with Reynolds Pigments. But it will pay you to check back and make sure. For when it's made with Reynolds Pigments, it's more than paint—it's *Liquid Aluminum*.

Reynolds Metals Co., Pigment Division,
19 East 47th Street, New York 17, N. Y.

IT'S MORE THAN PAINT ... IT'S

REYNOLDS ALUMINUM PIGMENTS

LIQUID ALUMINUM

# VITAL TOOL FOR *Management!*

## Use it to *SPREAD* the national debt!

### WITH MANAGEMENT BACKING, PAYROLL SAVINGS PLAN CAN HELP BUSINESS AND NATION

In 19,000 companies, the Payroll Savings Plan (for the regular purchase of U. S. Savings Bonds) has made employees more contented in their jobs—has cut down absenteeism—has even reduced accidents!

In addition, of course, the Plan builds financial security for each participant. Each Bond pays $4 at maturity for every $3 invested.

But the Plan has other, far-reaching benefits —to business and to the nation—which are equally important to you.

### SPREADING THE NATIONAL DEBT HELPS SECURE YOUR FUTURE

The future of your business is closely dependent upon the future economy of your country. To a major extent, that future depends upon management of the public debt. Distribution of the debt as widely as possible among the people of the nation will result in the greatest good for all. How that works is clearly and briefly described in the brochure shown at the right. Request your copy—*today*—from your State Director of the Treasury Department's Savings Bonds Division.

### WHY EXECUTIVE BACKING IS VITAL

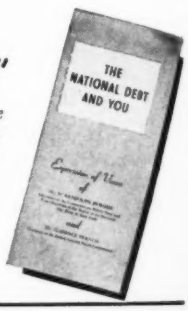
Employees still want the benefits of the Payroll Savings Plan. In fact, they *need* the P. S. P., because banks don't sell Bonds on the "installment plan"—which is the way most workers prefer to buy them. But wartime emotional appeals are gone. Human nature being what it is, the success of the Plan in your company is liable to dwindle unless a responsible executive keeps it *advertised*. The *reasons* for promoting it are as important as ever—to you, your company, and your country.

So—today—*check up* on the status of the Payroll Savings Plan in your company. *Act* on your responsibility to see that it is vigorously maintained.

The State Director will gladly help.

### *"The National Debt and You,"*

*a 12-page pocket-size brochure, expresses the views of W. Randolph Burgess, Vice Chairman of the Board of the National City Bank of New York, and Clarence Francis, Chairman of the Board, General Foods Corporation. Request your copy from the Treasury Department's State Director, Savings Bonds Division.*



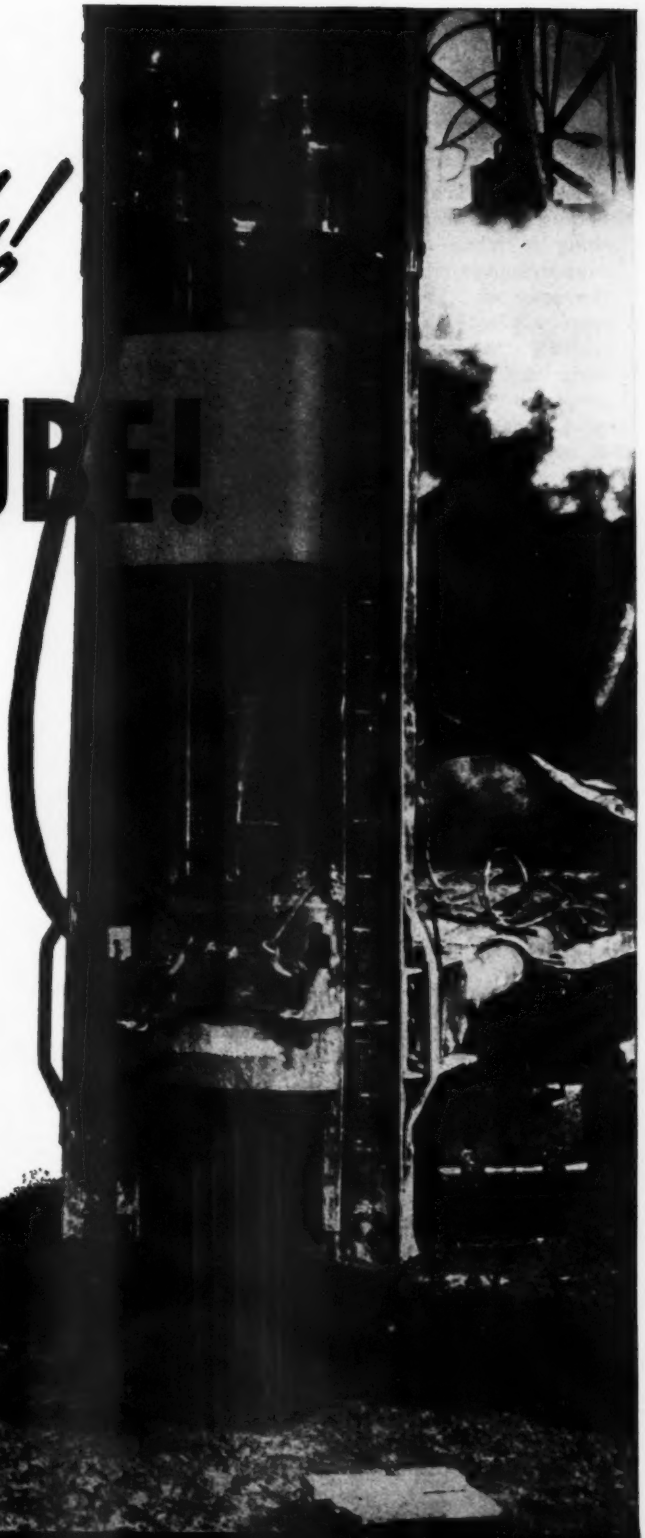

*The Treasury Department acknowledges with appreciation the publication of this message by*

## RAILWAY ENGINEERING AND MAINTENANCE

*This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council*

# Down to earth and *in for good!*

# MONOTUBE!



TAPERED steel Monotube piles are the choice of experienced engineers and contractors time after time—job after job. That's because Monotubes have a *combination* of advantages that mean down-to-earth economy and efficiency.

Check over these features—features that bring savings in time and money in constructing foundations for buildings, bridges, piers, airports, highways: Monotubes' fluted, tapered construction permits faster driving with average job equipment; Monotubes are easily extendible to any required length, right on the job; Monotubes are easy to handle, light in weight; Monotubes' tubular design permits quick checking top to toe, before concreting.

Monotubes' many advantages can help get your construction jobs—large or small—started *right.* Available in gauge, size, and taper to meet varying soil conditions. For complete information, write The Union Metal Manufacturing Company, Canton 5, Ohio.

## UNION METAL

*Monotube Foundation Piles*

# TRACK WORK A SPECIALTY

Track work is a Burro specialty because these cranes have everything it takes—speed, stamina, capacity and responsive control to the operator. Track gangs are more efficient when they work with a Burro because Burros were designed for railroad work—not adapted to it. Put a Burro to work in any one of the hundreds of maintenance-of-way jobs and see why it's saving time and costs for most of the country's railroads.

## *Only* BURRO *cranes have:*

- *Fast travel speeds—up to 22 M.P.H.*
- *Draw Bar Pull of 7500 lbs. (often eliminates need for work train or locomotive).*
- *Elevated Boom Heels for working over high sided gondolas.*
- *Short tail swing—will not foul adjoining track.*
- *Low overall height—Burro can be loaded and worked on a standard flat car (see illustration).*

*Write for Bulletins*

CULLEN-FRIESTEDT CO., 1301 S. Kilbourn Ave., Chicago 23, Illinois

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

# BYRD CONSTRUCTION COMPANY

*Railway Contractors*

# ROADBED Stabilization

**EXPERIENCED, EFFICIENT CONSTRUCTION OPERATIONS ON YOUR RAILROAD**

For more than 10 years we have specialized in scientific roadbed stabilization for leading railroads throughout the Southwest. Our experienced engineers can help you with problems brought about by higher track speeds and heavier motive power. We are completely equipped for service in any territory and solicit inquiries regarding your roadbed stabilization requirements. Write

BYRD-WHITE CONSTRUCTION CO.

*General Contractors*

P. O. Box 1601
MEMPHIS 1, TENN.

Telephones 35-6556
9-0613


# Supply Trade News

## Personal

The **Chain Belt Company,** Milwaukee, Wis., has announced the election of **B. F. Devine, L. B. McKnight** and **O. W. Carpenter** as vice-presidents.

**John J. Davis, Jr.,** has been appointed manager of sales, Railroad Division, of the **Inland Steel Company,** with headquarters at Chicago, effective January 1, succeeding **William J. Hammond,** who retired on that date.

**J. L. Grant** has been appointed office engineer and **Robert C. Schulze,** assistant general sales maager of the **P. & M. Co.,** both with headquarters at Chicago. **Charles J. Miller** has been appointed assistant eastern manager, with headquarters at New York.

**Bruce W. Grosvenor,** formerly sales manager of the general line division of **Bowser, Inc.,** has been appointed district manager of the sales and service office at Albany, N. Y., to succeed **I. D. Bone,** who has resigned after 27 years of service with the company.

**Raymond B. Johnson** has been appointed Philadelphia District sales manager for the **Champion Rivet Company,** to succeed **W. H. S. Bateman,** retired. The company also has announced that the Philadelphia, Pa., office will now be a direct sales branch office.

**Thomas B. Hasler,** formerly president of the **Wilson Welder & Metals Co.,** a wholly-owned subsidiary of the **Air Reduction Company,** has been elected chairman of the board of directors to succeed **C. E. Adams,** who resigned as chairman and director, and **F. B. Adams, Jr.,** has been elected president and a director.

**The Air Reduction Sales Company,** New York, has announced a number of personnel changes. **Dr. G. V. Slottman,** formerly manager, Technical Sales division, has been appointed technical assistant to the vice-president. **Scott D. Baumer,** assistant manager, Technical Sales division, has been appointed manager of that division, and **Edward H. Roper,** assistant manager.

**H. Merrill Bowman,** district sales manager of the **Link-Belt Company,** at Baltimore, Md., has been appointed assistant divisional sales manager for power transmission equipment, with headquarters at the company's Pershing road plant in Chicago. Mr. Bowman is succeeded by **Eugene S. Bogart,** who has been transferred from Pittsburgh (Pa.).

**J. V. Miller,** who has been on leave of absence as general storekeeper of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Milwaukee, Wis., since the middle of 1947 has joined the sales staff of the **Koehring Company,** Milwaukee, as manager of railroad equipment sales. In his new capacity Mr.

(*Continued on page* 182)

# What Counts Most in Successful Weed Control?

EXPERIENCE and KNOW-HOW rate highly in the specialized field of chemical weed control . . . as well as availability of proven chemicals.

**YOU can benefit by—**

1. Our background of over 35 years of railroad weed killing experience.
2. Our constant research and experimentation to determine effectiveness of new formulations.
3. Our wide variety of weed killing chemicals for specific types of weeds and conditions.
4. Our strategic plant locations throughout the country to facilitate distribution at minimum cost.
5. Our contract service covering application to roadbed and adjacent off-track locations.

Why not write now for recommendations based on YOUR weed problems? Early planning for your 1948 control program will insure chemical deliveries at the proper time, for the most economical and thorough weed killing job.

## CHIPMAN CHEMICAL COMPANY, INC.

Chicago, Ill. **BOUND BROOK, N. J.** Palo Alto, Calif.

Portland, Ore. Houston, Tex. No. Kansas City, Mo.

*Manufacturers of*

**ATLACIDE • ATLAS "A" • CHLORAX • CHIPMAN 2, 4-D**

# 2 SPECIAL LUBRICANTS for Railroad Maintenance

Gallon size
4 oz. Refillable oiler also available for use by mechanics

Shop Stick Size

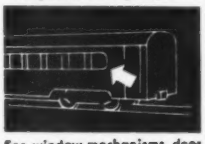
**Now being used by many railroads for a wide range of applications on rolling stock and maintenance of way, these special lubricants are recommended for efficiency, economy, and ease of application. Clean—fast working—long lasting!**

## AMERICAN DRIPLESS OIL

"Runs in—Will not run out." Enters as a rapid penetrant, converts to a dripless, long wearing film, containing a chemical inhibitor for maximum rust-proofing. Will not drip or run at 200 degrees F. Will not gum or harden at 20 degrees below zero F. For hand brake mechanisms . . . wire rope cables of cranes and other lifting devices . . . release mechanism of gondola cars . . . car door tracks and locks . . . hinged sections of Diesel locomotives . . . etc.

For windshield wipers; cabin door, other hinges.

For loosening tight fittings, rusty nuts, bolts. For signals, etc.



For window mechanisms, door locks and checks.

## DOOR-EASE STICK LUBRICANT

Use like a crayon for clean lubrication of exposed surfaces—to stop squeaks and binding and prevent wear on door dovetails and strikers . . . berth chains . . . rubber bumpers, etc.

Mail Coupon for Free Samples and full details.

**AMERICAN GREASE STICK CO.**
**MUSKEGON, MICHIGAN**

R. W. PREIKSCHAT, Railroad Rep.
American Grease Stick Company,
8 S. Michigan Ave., Chicago, Ill.
**Send Free Samples and full details.**

Mr. _____ Title _____
Firm _____
Address _____
City _____ Zone ___ State _____


(*Continued from page* 180)

Miller will concentrate on products applicable to railroads and the industrial field, which are manufactured by Koehring and its subsidiary companies.

**Joseph J. Hite,** office engineer of the **American Hoist & Derrick Co.,** has been promoted to assistant chief engineer. He joined the company in 1936 and worked

Joseph J. Hite

as development engineer and office engineer, respectively. Mr. Hite is a member of the American Society of Mechanical Engineers.

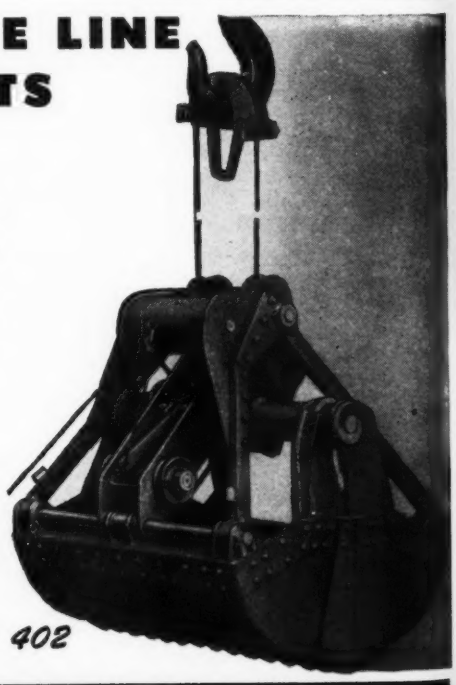
**W. K. Cox,** assistant general sales manager of the **Caterpillar Tractor Company,** has been appointed advertising manager, with headquarters as before at Peoria, Ill., succeeding **Gerald M. Walker,** who has retired. **J. J. Valentine,** Central Division sales manager, has been promoted to assistant general sales manager to succeed Mr. Cox. Mr. Valentine has been associated with the Caterpillar Tractor Company since 1929. He has served in the general sales, purchasing, treasury and export sales departments, and was stationed in the company's Washington, D. C., office several years ago.

J. J. Valentine

**Ferd D. Haberkorn,** manager of the Sales Training division, succeeds Mr.

(*Continued on page* 184)


# ERIE SINGLE LINE BUCKETS



ILLUSTRATED is the hook-on type, for intermittent service. It is reeved and ready for operation on overhead traveling crane, monorail hoist, locomotive crane, derrick, ships tackle or any other hoisting device which has but a single hoisting drum available for bucket duty. Just slip the yoke over the crane hook.

Erie Single Line buckets are also available in the direct-reeved type for permanent installation. Describe your Single Line bucket need — we'll give you our recommendations for we build all types and sizes.

● *Write for Booklet 402*

**ERIE BUCKETS** • *A Complete Line*

*Erie Steel Construction Co., 1182 Geist Rd., Erie, Pa.*

BUCKETS • AGGREMETERS • PORTABLE CONCRETE PLANTS

# COMPRESSION

## *Rail Anchors*

Delmer L. Curtis, Aerial Photo Service, Tulsa, Okla.

Two-way traffic calls for ***two-way holding.*** Compression Anchors provide such vital protection with assured efficiency and economy.

## THE RAILS COMPANY

General Office
178 GOFFE STREET, NEW HAVEN 11, CONN.

ST. LOUIS, MO. HOBOKEN, N. J. CHICAGO, ILL.

***MANY AN APPLE HAS LOOKED GOOD 'TIL THE FIRST BITE!***

And many a floor has looked like it would take a beating, 'til it went into service—

**but . . . It's The Results That Count**

And with **Stonhard Resurfacer** you are sure of the results . . .

- 100,000 satisfied customers
- 500,000,000 square feet in daily use
- 25 years of service assure those results.

*Return the coupon for FREE floor maintenance guide . . . there's no obligation.*

**STONHARD**

Building Maintenance Materials

*Serving the Railroads Since 1922*

811 Terminal Commerce Bldg.
Philadelphia 8, Pa.

STONHARD COMPANY
811 Terminal Commerce Bldg.
Philadelphia 8, Pa.

Send us a free floor maintenance guide and information about STONHARD RESURFACER.

Firm .....

Mr. ..... Title .....

Address .....

City ..... Zone ..... State .....


(*Continued from page* 182)

Valentine as sales manager of the Central division. **J. W. Mohler,** assistant sales manager of the Central division, becomes manager of the sales training division to succeed Mr. Haberkorn. Mr. Mohler is replaced as Central Division sales manager by **Herman S. Eberling,** a district representative in the Western division.

**Mark A. Clements,** service manager of the Western division for the **Caterpillar Tractor Company,** with headquarters at San Leandro, Cal., has been promoted to general service manager to succeed **D. O. Nash,** who has resigned to associate himself with a Caterpillar distributor having headquarters at Cheyenne, Wyo. **J. Dean Uhll,** service manager of the Central division, has been transferred to San Leandro to succeed Mr. Clements. **Ellsworth M. Iverson** succeeds Mr. Uhll as service manager of the Central division, and **T. M. Fahnestock** replaces Mr. Iverson as service engineer.

## Trade Publications

*(To obtain copies of any of the publications mentioned in this column, use postcards, page* 131*)*

**Caterpillar Tractors**—The Caterpillar Tractor Company has recently published an eight-page booklet entitled, "Going Places on Rubber." The book is liberally illustrated with pictures of rubber-tired equipment in action on a variety of jobs where it is necessary to carry loads long distances at high speeds, such as dam, road, airport and right-of-way construction projects. It also illustrates the equipment that is considered best suited to handle such operations as rock work, and leveling and filling.

**Wayne Crane**—The Wayne Crane division of the American Steel Dredge Company, Inc., has published a 20-page illustrated catalog, No. 406, describing a one-man operated, rubber-tired machine which serves as a 5-ton, ½-yd. clamshell, dragline, power shovel or trench hoe. Two booms and attachments are interchangeable. The book gives complete operating and specification data.

**Terra-Cobra Earthmover**—The Wooldridge Manufacturing Company has released a new 12-page, illustrated bulletin describing the improved operation and construction features of its Terra-Cobra high-speed, self-propelled earthmovers. Highly illustrated, the booklet depicts several projects of various types showing the earthmovers at work.

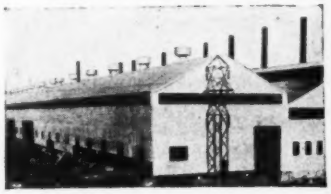
**Torque-Converter Tractor**—The Tractor division of the Allis-Chalmers Manufacturing Company has issued a six-page folder describing the new HD-19 torque-converter tractor. In addition to listing such features as its 40,000-lb. weight, 163-hp. (net engine), and hydraulic torque-converter drive, the pamphlet emphasizes the advantages of the tractor's increased capacity, longer life, and operator comfort. The folder has a full page of views of the HD-19 in operation on such jobs as stump removal, road building, logging,

(*Continued on page* 186)


**TIME PROVES**

**Galvanized (ZINC-COATED) Sheets Stay Stronger Longer**

**34 YEARS . . .** Erected in 1913, and covered with heavy-gauge galvanized sheets, this Tennessee concentrating plant of the A/Z Company, is still in excellent condition after *more than 3 decades of service.* Painted with Gray Metallic Zinc Paint in 1932.



In building for the future, look to the past for proof of a building material's strength . . . durability . . . service. With galvanized (zinc-coated) roofing and siding, you get the strength of steel . . . the rust protection of Zinc. So for low-cost, long-time service, choose the building material that's proved by TIME itself . . . galvanized sheets. Send coupon for information about Zinc and how it can help keep your buildings and equipment stronger longer.

ZINC INSTITUTE 2 OZ. COATING SEAL OF QUALITY

This "Seal of Quality" is your guide to economy in buying galvanized sheets. It means they carry at least 2 oz. of Zinc per sq. ft.

**AMERICAN ZINC INSTITUTE**

Room 2831 • 35 E. Wacker Dr. Chicago 1, Ill.

**FREE BOOKLETS!**

Send me without cost or obligation the illustrated booklets I have checked.

- ☐ Repair Manual on Galvanized Roofing and Siding
- ☐ Facts about Galvanized Sheets
- ☐ Use of Metallic Zinc Paint to Protect Metal Surfaces

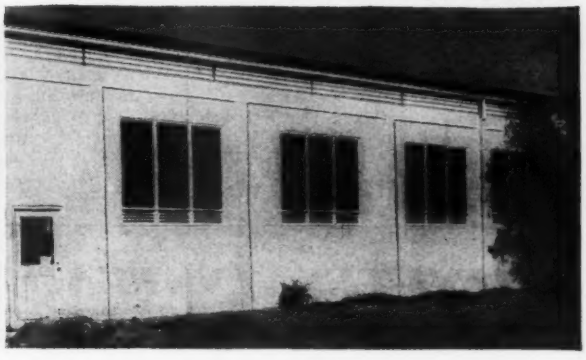
Name .....

Address .....

Town ..... State .....

# TILT-UP ....for fast, economical CONCRETE construction

Above: Wall section being tilted into position. Lower Left: Wall sections braced in place. Lower Right: Completed wall with cast-in-place connecting piers and beam.



***TILT-UP*** is a tested and proven method of concrete construction adaptable to standard or individually designed buildings. It saves time, money and materials in erecting freight and passenger stations, warehouses, machine shops and other service and maintenance units. It is practical for multi-story as well as one-story structures.

***Tilt-up*** construction is easy and simple. Wall panels are cast flat—usually right on the concrete floor—and then tilted up into position with your own power equipment. This eliminates many form-building and form-handling problems. Panel lengths and heights can be readily adjusted to meet a wide variety of requirements.

Structures built by the ***tilt-up*** method have all the desirable properties of any concrete building. They are firesafe, decay-proof, trim and neat in appearance. Their first cost is moderate, they last a lifetime and cost little to maintain. They are truly ***low-annual-cost*** construction.

Learn more about this time-saving, economical method of construction. Write today for free technical bulletins, containing design and construction details. Distributed only in the United States and Canada.

## PORTLAND CEMENT ASSOCIATION

**DEPT. 2-27 • 33 W. GRAND AVENUE • CHICAGO 10, ILLINOIS**

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

(*Continued from page* 184)

bulldozing, and earth moving with scrapers, and also devotes a page to specifications relative to engine construction, steering design, speeds and drawbar pull, and general dimensions of the tractor.

**Stonhard Resurfacer**—The Stonhard Company has recently published an illustrated folder describing Stonhard Resurfacer, a heavy-duty material for repairs and overlays to concrete and wood floors. The pamphlet lists the characteristics of the material and illustrates several typical installations to demonstrate the versatility of this material in solving floor problems for a variety of industries.

**Plastic Rock Floors**—This is a four-page booklet, recently issued by United Laboratories, Inc., Cleveland, Ohio, showing the essential characteristics of this company's resurfacing material known as Plastic Rock. The folder is illustrated with before and after views of a freight-house platform on which Plastic Rock was used and with other illustrations showing applications of the material. Also included are instructions for mixing and applying it.

**Maintenance Checking Chart**—United Laboratories, Inc., Cleveland, Ohio, issued a six-page folder which classifies, in tabular form with respect to use, all of the products manufactured or supplied by this company. The principal classifications include roofs, floors, driveways, waterproofing and dampproofing, metal surfaces, wood surfaces and masonry surfaces, with one or more sub-classifications under each of the main headings. Shown with each sub-classification are products recommended by this company to effect repairs to these surfaces or to prepare them for resurfacing or refinishing.

**Weatherproofing for Metal Surfaces**—The Arco Company has published a new 12-page, illustrated bulletin entitled "Lasting Protection for Metal Surfaces," which describes a recent development for protecting outdoor structures against weathering. It tells how the company's "Dum Dum for Metal" provides a tough but elastic and pliable weather-resistant, water-repellent coating for use on both new or uncoated metal structures, and over previously cooled surfaces, "sealing out" measurable moisture, vapor and chemical gases and fumes.

**Cement Waterproofing**—Ranetite Manufacturing Company, St. Louis, Mo., has issued a 12-page booklet describing the application of its No. VVV cement waterproof mortar in waterproofing cellars, tunnels, reservoirs, dams, tanks and concrete roofs. The booklet gives complete instructions for mixing the mortar, preparing surfaces to receive it and details of its application. Suggestions are included for overcoming special problems such as in coveing and for relieving water pressure where it interferes with the work. The booklet concludes with a set of instructions for estimating the quantity of Ranetite VVV cement waterproofing required for projects of various types.

**LaPlant-Choate Scrapers**—The LaPlant-Choate Manufacturing Company, Inc., has published two new illustrated pamphlets describing this company's hydraulic and cable-operated scrapers. The booklet devoted to the hydraulic scraper shows how the two-wheel scraper can be used with most types of industrial rubber-tired tractors of sufficient drawbar horsepower, while the four-wheel scraper can be used with any track-type tractor within 35-55 drawbar-horsepower range. It also contains many action pictures of the four-yard scraper at work on a variety of jobs. The pamphlet on the cable-operated scrapers describes and illustrates job applications of these scrapers. It also gives production and cost figures and points out how maximum production can be obtained.

**Syntron Equipment**—The Syntron Company has published a new 92-page, illustrated catalog which describes this company's complete line of vibratory material-handling equipment, including electromagnetic vibrators, packers, vibratory feeders, dry feeder machines, weighing feeders, vibrating grizzlies, vibrating lawns, paper joggers, hopper level switches, explosion-proof hydraulically operated feeders, vibrators, jolters and feeder machines, and mechanical shaft seals. The catalog also contains descriptions of the company's construction and maintenance tools, which include self-contained gasoline paving breakers, and portable electric hammers, drills, grinders, sanders, electro-magnetic form vibrators, and flexible-shaft concrete mass vibrators.


***MINUTES—INSTEAD OF HOURS!***

**with**

*SYNTRON*

**CONSTRUCTION and MAINTENANCE TOOLS**

***Whatever your job may be—***

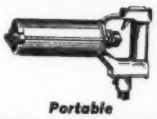
Busting out concrete, cutting asphalt; digging clay, shale and frozen ground; breaking out ice; driving spikes and ground rods; tamping backfill—drilling, cutting and chipping concrete and masonry; scaling rust and paint from metal surfaces—drilling, sanding, buffing and polishing wood and metal—grinding welds, wire brush work, snagging castings—vibrating concrete forms and concrete mass—

SYNTRON has a modern, efficient tool to do it, and do it quickly—cutting time and costs.

Write for illustrated literature.

**SYNTRON CO., 290 Lexington, Homer City, Pa.**

*Gasoline Hammer*
**PAVING BREAKERS**

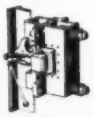


*Portable*
**ELECTRIC HAMMERS**

*Portable*
**ELECTRIC DRILLS**

*Electric Motor*

*Gas Engine*



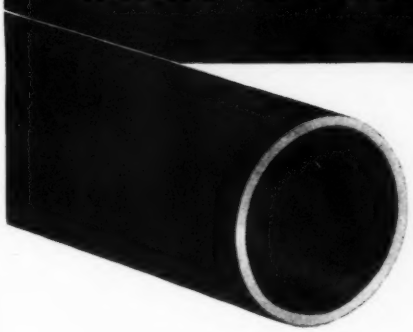
*Form*

**CONCRETE VIBRATORS**

*Portable*
**ELECTRIC GRINDERS**

*Portable*
**ELECTRIC SANDERS**

# PITTSBURGH-ERIC PROCESS RECONDITIONS SMALL MAINS IN PLACE



- Speed Up Water Service
- Reduce Pumping Costs
- Get Fullest Capacity

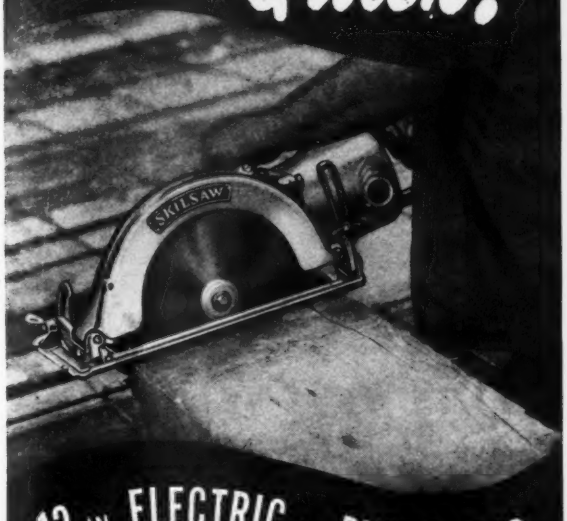
from old water lines at a fraction of the cost of replacement!

Pittsburgh-Eric Process provides a combined pipe cleaning and lining service whereby small water mains, 3″ to 24″ I.D., can now be reconditioned at low overall cost. Because the pipe is cleaned DOWN TO THE METAL, full flow capacity is restored! Because the LECTUMEN lining, electrolytically applied, is highly resistant to the corrosive action of soft or aggressive waters, tuberculation and deposition are reduced to a minimum. Many additional years of useful pipe service are thus assured without the necessity of capital expenditure for pipe replacement!

Get the utmost in water main efficiency plus pipe protection for many years! Ask about a Pittsburgh-Eric Pipe Reconditioning Program for your water service lines TODAY!

**PITTSBURGH PIPE CLEANER CO.**
133 DAHLEM ST. PITTSBURGH 6, PA.
PHILADELPHIA BALTIMORE WASHINGTON
NEW YORK BUFFALO CHICAGO
CINCINNATI ST. LOUIS DETROIT BOSTON

# This is the Portable SAW that CUTS 8 x 16's *Quick!*

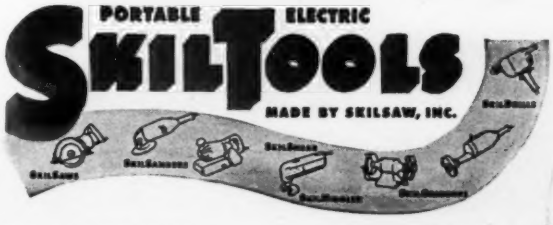


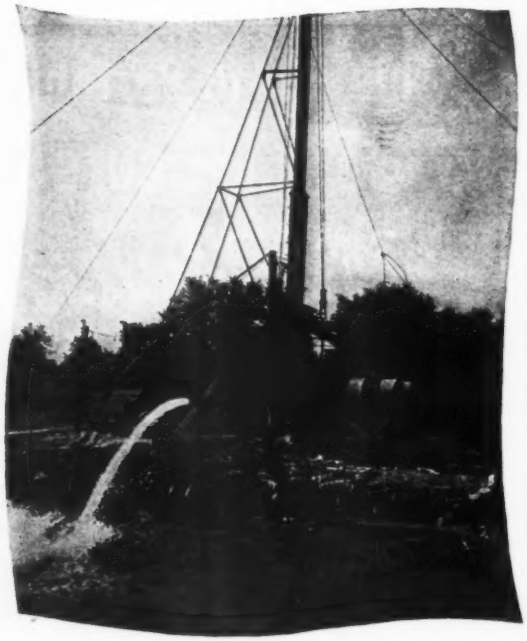

## 12 IN. ELECTRIC or PNEUMATIC SKILSAW!

● Either model cuts 4⅜ in. deep, rips or crosscuts 8-inch timbers in two quick cuts. Electric SKILSAW operates from power lines or portable generators on voltages up to 250 v. Pneumatic SKILSAW operates at maximum horsepower on 75 cu. ft. of free air under 80 to 100 lb. air pressure. Both SKILSAWS go right to the job, save time, labor, material handling . . . step up the output of your construction gangs. Ask your distributor today for a demonstration.

**SKILSAW, INC.**
5033-43 Elston Ave., Chicago 30, Ill.
*Factory Branches in All Principal Cities*

PORTABLE ELECTRIC
**SKILTOOLS**
MADE BY SKILSAW, INC.

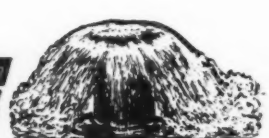




CITY OF ROLLA, MO.

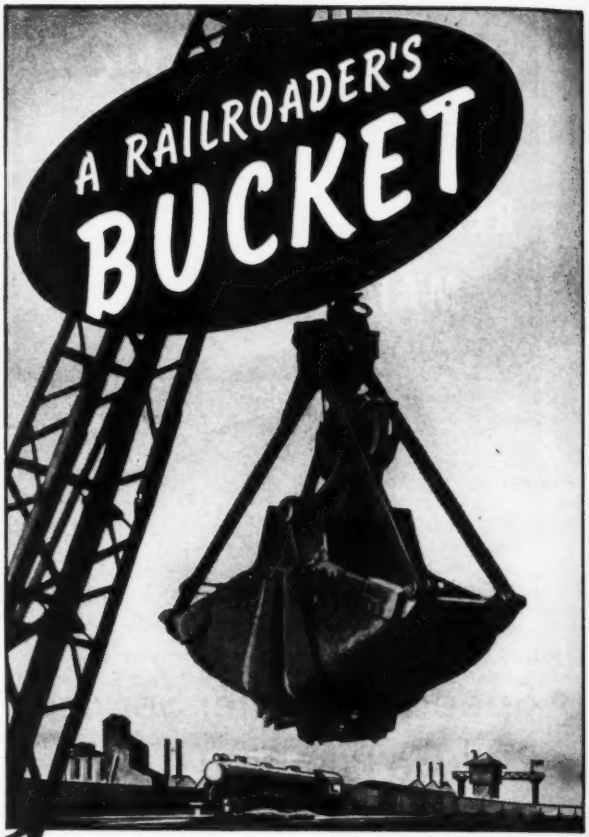
## THIS IS THEIR *Fourth* LAYNE WELL

*The* picturesque and progressive city of Rolla, Missouri, has assured itself of much greater residential, business and industrial growth by adding the fourth Layne Well Water Supply unit, to step their daily water capacity up to 2,500,000 gallons. In purchasing these carefully designed and precision built wells and pumps, the city has made an excellent financial investment. Operating at an unusually low cost, their Water System will show a substantial annual profit. Furthermore, their Layne Wells and Pumps will probably need only very minor repairs for years and years. Layne Well Water Supply Systems, whether installed for cities, factories, railroads, chemical plants, refineries or irrigation projects, can be depended on to give outstanding satisfaction. For further facts, address LAYNE & BOWLER, INC., General Offices, Memphis 8, Tennessee.



**LAYNE WELL WATER *Systems***

**AFFILIATED COMPANIES:** Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio * Layne-Pacific, Inc., Seattle, Washington * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Western Co. of Minnesota, Minneapolis, Minnesota * International Water Supply Ltd., London, Ontario, Canada * Layne-Hispano Americana, S. A., Mexico, D. F.




Blaw-Knox No. 665-RN is a ½ cu. yd. 2-line, round nose, lever arm bucket for many uses. Many railroads find it equally adaptable for ditching, ballast handling, refuse removal, coaling, etc. Like all Blaw-Knox Buckets, it gets more work done with less crane time. For a quick look at the many types and sizes of Blaw-Knox Buckets in railroad use—write today for Bulletin No. 1989.

**BLAW-KNOX DIVISION**
**of Blaw-Knox Company**
2054 Farmers Bank Bldg.
Pittsburgh 22, Pa.

***BUCKET SELECTION MADE EASY!***

# BLAW-KNOX CLAMSHELL BUCKETS

*on the Job with*

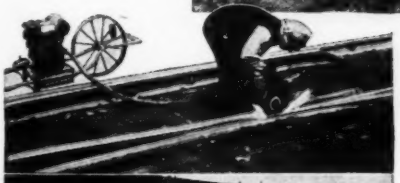
# WISCONSIN POWERED

## *Maintenance Equipment!*

**Typical of the many and varied railway maintenance operations that are now most advantageously handled by Wisconsin Engine-powered equipment, are those illustrated below. It is a noteworthy fact that these manufacturers specify "Wisconsin Heavy-Duty Air-Cooled Engines" as standard power for the operation of their equipment . . . a well-founded tribute to the extreme dependability, all-weather serviceability, economy, operating efficiency and adaptability of Wisconsin Air-Cooled Engines.**

**Spraying rail joints with Wisconsin-powered Fairmont W61 Series A Oil Spray Car, made by Fairmont Railway Motors, Inc., Fairmont, Minn.**

**Woolery Jr. Weed Burner, made by Woolery Machine Co., Minneapolis, Minn., engaged in clearing track of heavy weed growth.**



**Frog grinding with Model P-22 Portable Flexible Shaft Grinder, for steam railroad use, made by Railway Track Work Co., Philadelphia, Pa.**

**Tie tamping with Wisconsin-powered tamping outfit made by Electric Tamper & Equipment Co., Ludington, Mich.**

**Northwestern 540-DA double head type Rail and Frog Grinder, made by Northwestern Motor Co., Eau Claire, Wis., grinds either rail or both rails of frogs or cross-overs without turning machine around.**

**Wisconsin Heavy-Duty Air-Cooled Engines are supplied in a complete power range from 2 to 30 hp., in 4-cycle single cylinder and 4-cylinder types.**

**WISCONSIN MOTOR CORPORATION**

*World's Largest Builders of Heavy-Duty Air-Cooled Engines*

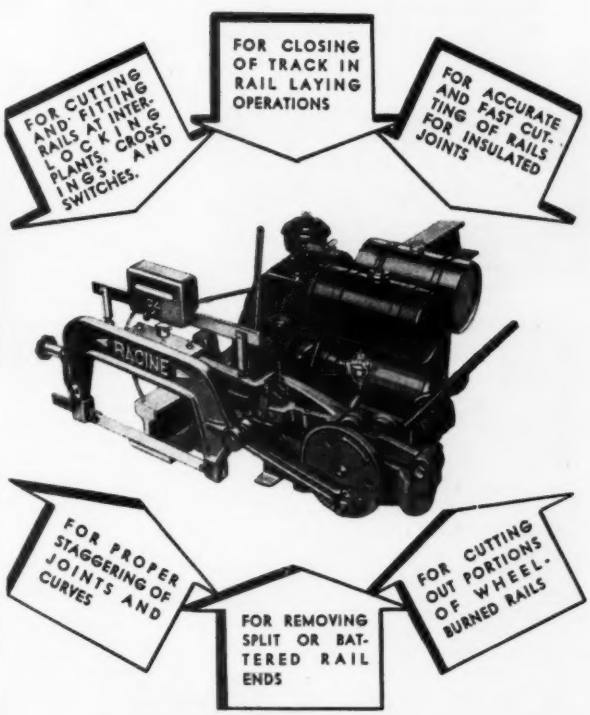
MILWAUKEE 14 WISCONSIN



# RACINE *Portable* RAIL SAWS

## *For any Rail Cutting Job* IN TRACK OR SHOP

Today's users of RACINE portable RAIL SAWS are continually enjoying the many economies made possible by RACINE'S faster and more accurate method of rail cutting. Here is a one-man tool that substantially reduces time and costs per cut. 100 lb. rail can be cut in an average of 5 minutes. 130 lb. rail in 7 minutes.


FOR CUTTING AND FITTING RAILS AT INTERLOCKING PLANTS, CROSSINGS, AND SWITCHES.
FOR CLOSING OF TRACK IN RAIL LAYING OPERATIONS
FOR ACCURATE AND FAST CUTTING OF RAILS FOR INSULATED JOINTS
RACINE
FOR PROPER STAGGERING OF JOINTS AND CURVES
FOR REMOVING SPLIT OR BATTERED RAIL ENDS
FOR CUTTING OUT PORTIONS OF WHEEL-BURNED RAILS

Racine Rail Saws are truly portable. They can be easily transported by two men. Only one man needed to operate. Saw blades are of special alloy steel developed to assure maximum speed and cutting economy. Cuts as thin as 3/10 of an inch can be made quickly and accurately. Models are available with gasoline, electric or compressed air motors. Write today for complete Catalog. Address Racine Tool & Machine Co., 1738 State St., Racine, Wisc.

STANDARD FOR QUALITY AND PRECISION · RACINE TOOL and MACHINE CO.

**RACINE**

STANDARD FOR QUALITY AND PRECISION

## UP AND DOWN THE LINE.. *Wherever Work Crews Go*

*Clean, Cool*

**DRINKING WATER . . .**
**AT THE PRESS OF A BUTTON**

. . . DOBBINS PORTABLE, SANITARY DRINKING FOUNTAIN banishes germ-spreading cups, dippers and pails. Helps protect the health of railway employees while on the job and far removed from a permanent water supply . . . an aid to locomotive engineers, section hands and other workers. Four gallon capacity tank is fully insulated . . . air pressure for instant flow of water is provided with a few strokes of the pump. Operates like any bubbler drinking fountain.

Send for *free* descriptive folder, or order from price list below.

**A BOON TO MAINTENANCE AND CONSTRUCTION CREWS.**
The Dobbins Portable Fountain assures an adequate supply of pure, cool drinking water on any job, anywhere. Meets all requirements of public health authorities.

**DOBBINS MANUFACTURING COMPANY**
**DEPT. 220, ELKHART, INDIANA**

**Dobbins Superbilt**
PORTABLE DRINKING FOUNTAIN

**FOUNTAIN AND ACCESSORIES AVAILABLE FOR IMMEDIATE DELIVERY**

No. 18—Dobbins Superbilt **Portable Drinking Fountain** less all accessories . . . Only $17.60
**Salt Tablet Dispenser,** 500 tablets capacity, extra . . . 2.75
Adjustable, Waterproof **Carrying Strap,** extra 1.15
**Spill Cup,** to catch overflow when used indoors . . . 3.50
**Mounting Bracket** holds fountain to wall or floor of buildings, trucks, tractors, locomotives, etc. . . . 4.50

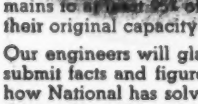
*All Prices F.O.B. Elkhart, Indiana*

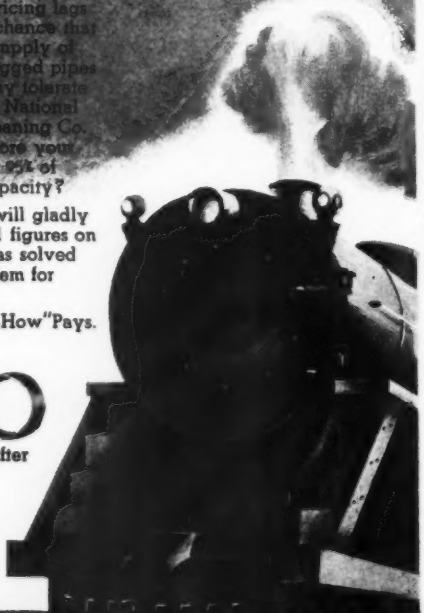
## handle 'em faster
WITH CLEAN WATER MAINS

When train servicing lags there's a good chance that an inadequate supply of water due to clogged pipes is the cause. Why tolerate delay when the National Water Main Cleaning Co. can quickly restore your mains to at least 95% of their original capacity?

Our engineers will gladly submit facts and figures on how National has solved this costly problem for other railroads.

National "Know-How" Pays.

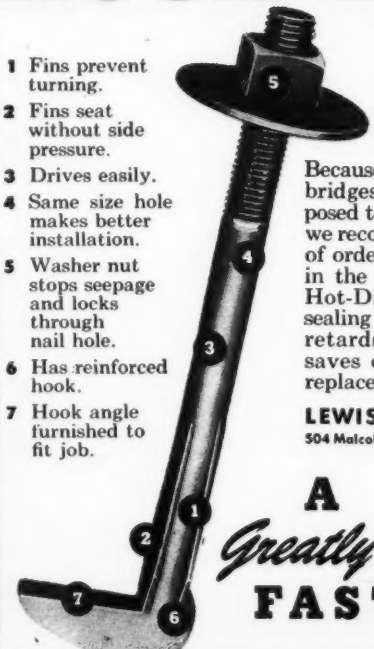


NATIONAL WATER MAIN CLEANING CO.
51 CHURCH STREET, NEW YORK 7, N. Y.

# SEALTITE HOOK BOLT

1 Fins prevent turning.
2 Fins seat without side pressure.
3 Drives easily.
4 Same size hole makes better installation.
5 Washer nut stops seepage and locks through nail hole.
6 Has reinforced hook.
7 Hook angle furnished to fit job.




***Double Life***
**SEALTITE HOOK BOLTS**

Because railroad trestles and bridges are constantly exposed to corrosive conditions we recommend the economy of ordering your hook bolts in the Sealtite Double-Life Hot-Dip galvanized finish sealing the bolt in zinc which retards all corrosion and saves expense of frequent replacement.

**LEWIS BOLT & NUT CO.**
504 Malcolm Ave. S. E., Minneapolis, Minn.

**A *Greatly Improved* FASTENER**

WARWOOD WORKMANSHIP
MAKES THE DIFFERENCE

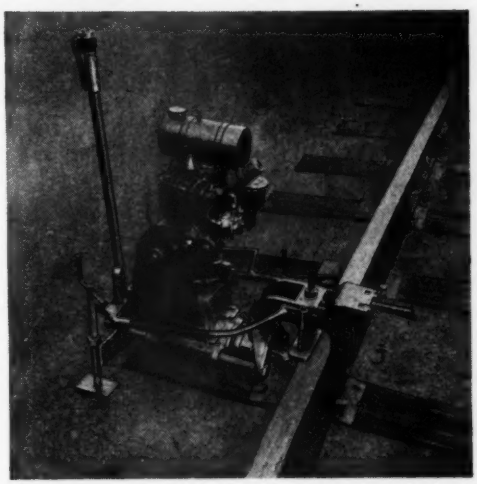
For track construction and general maintenance of way work the Warwood Spike Maul is correctly designed. Accurately forged and scientifically heat treated to meet AREA specifications and to withstand severe service. Press forged to develop fine granular structure of steel and to prevent crystallization, Warwood is the name to remember when buying Spike Mauls. Made in both Warwood Standard and Warwood Alloy grades.

*PICKS... MAULS... WRENCHES*
*BARS... TONGS... SLEDGES*
*ADZES... PUNCHES... CHISELS*

WARWOOD SINCE 1854 FORGED TOOLS

WARWOOD TOOL COMPANY
WHEELING, WEST VIRGINIA

# NEW RTW
# POWER TRACK DRILL
## Designed for Savings



Model P-34-A Power Track Drill

Modern in design, up-to-date in construction, this new track drill embodies many features that help speed rail maintenance at materially reduced costs.

The P-34-A consists of a 1½ hp air-cooled gasoline engine, with V-Belt drive from the engine shaft to a counter shaft which drives drill through a gear reduction assembly.

Gear reduction housing is cast aluminum to reduce weight. Steel frame, of lasting strength and durability, is designed to provide fast, accurate leveling with rail and irregular or uneven ground. There is also ample adjustment to various rail sizes.

For easy operation, lateral travel for feeding drill is controlled by a ratchet gear and rack. The chuck will take a flat beaded bit up to 1½ inches and will drill a hole in less than a minute.

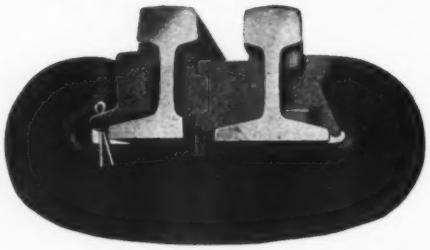
Belt is adjusted by raising or lowering motor on frame. Guards are installed for protection around frame.

Well balanced, light weight, portable, quick to attach and remove from rail, the P-34-A Power Track Drill is designed for durability, easy handling and to insure efficient rail maintenance.

Further information on the P-34-A and other RTW machines sent on request.

Railway Track-work Co.
3207 KENSINGTON AVE., PHILADELPHIA 34, PA.
2076

## For Efficient and Economical Service



# Q and C UNIVERSAL TYPE GUARD RAIL CLAMPS

The sturdy drop forged yoke of heat treated steel is designed of I-beam construction to insure extra strength and holding power.

One size of yoke is suitable for a range of rail sections, which simplifies and reduces your storeroom stocks.

**Order now for early delivery.**

**THE Q AND C COMPANY**

**Chicago 5 New York 6 St. Louis 1**



*Dozens of Repair Jobs in a single day.... with* **TRAIL-O-ROLLER**

Speed, efficiency and economy make Littleford's TRAIL-O-ROLLER an invaluable part of your black top maintenance crew. It trails the maintenance truck at any speed, yet brings the compaction of a five-ton tandem roller to your crossing and platform repairs. Patented hydraulic lift permits changing from trailing to rolling or back again in two minutes flat! Better crossings make friends. Write for catalogue.

LB LITTLEFORD

LITTLEFORD BROS., INC.
471 E. Pearl St., Cincinnati 2, Ohio


CLASSIFIED ADVERTISEMENTS

Use this section when seeking a new man, new position, or when buying or selling secondhand equipment.

CLASSIFIED ADVERTISEMENTS, $10.00 an Inch, one inch deep by three inches wide, an insertion.

EMPLOYMENT ADVERTISEMENTS, 10 Cents a word a month, including address, minimum charge $2.00.

Remittance must accompany each order.

Railway Engineering and Maintenance
Classified Advertising Department
105 West Adams St., Chicago 3

## POSITION WANTED

TRACK MAN, UNDER 35 YEARS, PREFERABLY WITH ENGINEERING TRAINING, REQUIRED FOR WORK AS ASSISTANT ROADMASTER ON RAILWAY IN CENTRAL AMERICA. GOOD WORKING KNOWLEDGE OF SPANISH ESSENTIAL. REPLY BOX 248 GIVING FULL PARTICULARS OF PREVIOUS SERVICE AND SALARY EXPECTED. RAILWAY ENGINEERING & MAINTENANCE, 105 WEST ADAMS ST., CHICAGO 3, ILLINOIS.

# For SAFE Handling

**Of Railroad Ties, Bridge Timbers, Pulpwood, Wood Crates, Other Timber Products.**

MACK SAFETY HAND TONGS
MACK LOG & TIE TONGS
MACK PULPWOOD GRAPPLES

## MACK WELDING CO.

**Manufacturers of Material Handling Equipment**

**9206 Grand Ave. Place, Duluth 8, Minn.** Distributors in Principal Cities, U.S. and Canada.

## DRAG IT, TWIST IT, SCUFF IT!

YOU CAN'T HURT THE LUFKIN "ANCHOR" CHROME CLAD STEEL TAPE

Husky, handy for all-round railroad measuring work—that's the Lufkin "Anchor" Chrome Clad Steel Tape. Drag it over rough ground! Twist it! Scuff it against ragged surfaces! You can't damage the satin chrome finish that will not crack, chip, or peel. Jet black markings are always easy to read—they're recessed so they can't wear out. Genuine leather case. Specify Lufkin and get the best. For free catalog write THE LUFKIN RULE CO., SAGINAW, MICH., New York City.

**LUFKIN**

**FOR ACCURACY**

## 4 BIG FEATURES MAKE THE NEW Simplex TYPE "A" TRACK JACKS your best Buy

**UP TO 31% EASIER LIFTING**
Shorter fulcrum center reduces effort needed to lift load.

**LOWER MAINTENANCE**
New Pin-Type pawl and socket construction prevents grit accumulation . . . reduces wear 81%.

**GREATER SAFETY**
New safety Thumb guard prevents finger injuries when tripping jack.

**LONGER LIFE**
Larger striking surface eliminates concentration of wear at a single point.

4 SIZES...15-TON CAPACITY

| | |
|---|---|
| 215A | 5" Lift |
| 216A | 8" Lift |
| 217A | 13" Lift |
| 218 | 19 1-4" Lift |

Bulletin No. T-and-B47, just off the press, describes the money- and labor-saving features of these new Simplex Track Jacks in detail. Write for your copy today.

Simplex Jacks
LEVER - SCREW - HYDRAULIC

TEMPLETON, KENLY & CO., CHICAGO 44, ILL.
1026 South Central Avenue

## OILED AIR* FOR PNEUMATIC TOOLS

## New ARNOLD LUBRICATOR

**Light Weight**
**Easily Portable**

The new Arnold Lubricator supplies oiled air* for all pneumatic tools.
Arnold gives you all of these features:

**VISIBLE OIL SUPPLY**—The pressure-proof window eliminates guess work. If oil is there, you see it.

**POSITIVE LUBRICATION**—good to the last drop. Patented feeder insures automatic lubrication.

**LIGHT WEIGHT**—made from new aluminum alloy, most popular size weighs only 14 ounces.

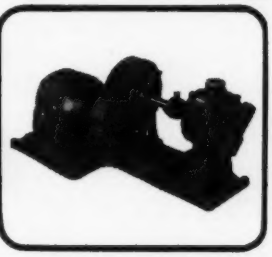
**STRONG**—this rugged lubricator can take it, actually stronger than cast iron.

**FOUR MODELS**—Sizes from 1/6 pt. to 1 pt. capacity. Pipe size to one inch.

*FREE—CATALOGUE SHEET*
Order from your dealer
If he cannot supply you, write direct, sending us your dealer's name.

**The RUCKER Company**
4228 Hollis Street Oakland 8, Calif.
*Copyright 1945

## It Pays to Know GENUINE VIKING PUMPS



KNOW genuine Viking pumps and what they will do for you. They are the original in the rotary "gear within a gear" principle . . . the leader in the industry.

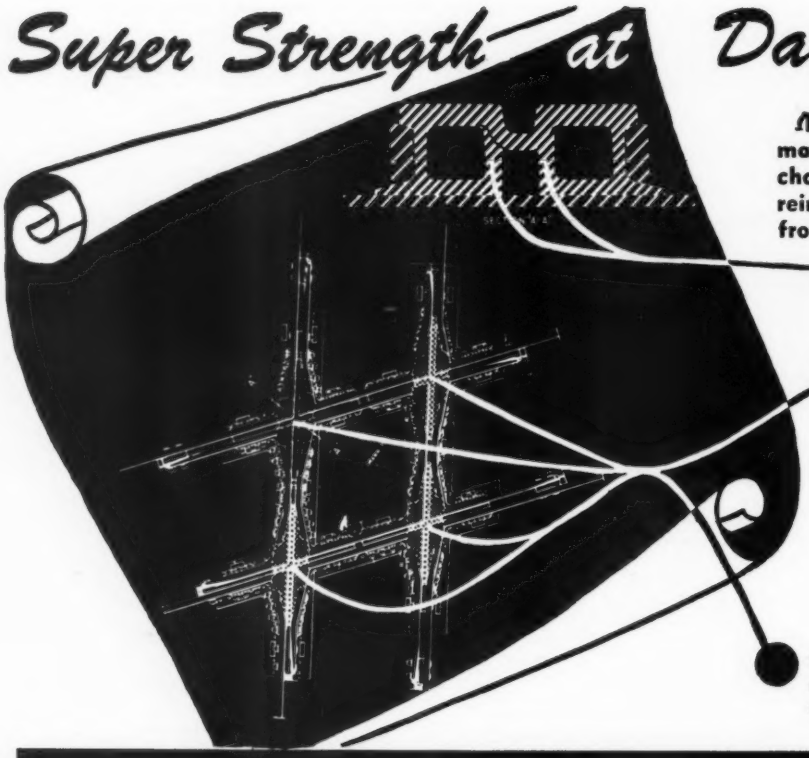
Remember, please, that Vikings are engineered for your job . . . they are ruggedly constructed, with no small, intricate parts or timing gears to get out of order. Vikings mean long, trouble-free pumping service. Look for the registered Viking trademark or name on every genuine Viking pump. These are your guarantee of Viking superiority.

**Be sure, when you buy, that the pumps you get are genuine Vikings. Write and tell us about your pumping problem. Ask for Bulletin Series 47SY. It will be sent free immediately.**

See Our Catalog In SWEETS

**Viking** PUMP COMPANY
Cedar Falls, Iowa

# Super Strength at Danger Spots!



Morden-designed railbound manganese crossing, with interchangeable reversible inserts and reinforced intersections for angles from 50° to 90°, provides:

- Supporting ribs under intersections cast integral with the main casting.
- Manganese inserts interchangeable for all corner intersections, and reversible at each intersection. All castings are alike and can be placed at either an end frog or center frog location, or replaced end for end in the existing location to provide a new running surface.
- The manganese inserts can be furnished with intersections hammered to a Brinell hardness of 350 minimum.

**Morden Frog and Crossing Works** CHICAGO, ILL.

Representatives in: CLEVELAND, OHIO; NEW ORLEANS, LA.; LOUISVILLE, KY.; ST. LOUIS, MO.; WASHINGTON, D. C.


## ALPHABETICAL INDEX TO ADVERTISERS, FEBRUARY, 1948


**A**

Air Reduction Sales Co. ..... 130
Allis-Chalmers Tractor Division ..... 114-115
American Brake Shoe Company ..... 140
American Chain & Cable Co. ..... 102
American Grease Stick Company ..... 182
American Hoist and Derrick Company ..... 108
American Zinc Institute ..... 184
Armco Drainage & Metal Products, Inc. ..... 128

**B**

Barco Manufacturing Company ..... 133
Beall Tool Division of Hubbard & Co. ..... 120
Bethlehem Steel Company ..... 99
Black & Decker Mfg. Co., The ..... 107
Blackmer Pump Company ..... 129
Blaw-Knox Company ..... 188
Briggs & Stratton Corporation ..... 172
Byrd-White Construction Co. ..... 180

**C**

Caterpillar Tractor Co. ..... 118
Chicago Pneumatic Tool Company ..... 126
Chipman Chemical Company, Inc. ..... 181
Cullen-Friestedt Co. ..... 180

**D**

Dobbins Manufacturing Company ..... 190

**E**

Eaton Manufacturing Company ..... 98
Electric Tamper & Equipment Co. ..... 124
Erie Steel Construction Co. ..... 182

**F**

Fabreeka Products Company, Incorporated ..... 134
Fairbanks, Morse & Co. ..... 113
Fairmont Railway Motors, Inc. ..... 138
Flintkote Company, The ..... 103

**H**

Hubbard & Co. ..... 120

**I**

Independent Pneumatic Tool Company ..... 109
Industrial Brownhoist Corporation ..... 125

**K**

Koppers Company, Inc. ..... 121

**L**

Layne & Bowler, Inc. ..... 188
Le Roi Company ..... 105
LeTourneau, Inc., R. G. ..... 110-111
Lewis Bolt & Nut Co. ..... 190
Link-Belt Speeder Corporation ..... 135
Littleford Bros., Inc. ..... 192
Lufkin Rule Co., The ..... 193

**M**

Mack Welding Co. ..... 192
Mall Tool Company ..... 120
Morden Frog and Crossing Works ..... 194

**N**

National Lock Washer Company, The ..... 97
National Water Main Cleaning Co. ..... 190
Nordberg Mfg. Co. ..... 177
Northwest Engineering Company ..... 101

**O**

Ohio Electric Mfg. Co., The ..... 178
Oliver Corporation, The ..... 116
Oxweld Railroad Service Company, The ..... 127

**P**

P. & M. Co., The ..... 195
Page Steel and Wire Division ..... 102
Pittsburgh Pipe Cleaner Co. ..... 187
Portland Cement Association ..... 185

**Q**

Q and C Company, The ..... 192

**R**

Racine Tool and Machine Co. ..... 189
Railroad Accessories Corporation ..... 137
Railroad Products Company ..... 174
Rails Company, The ..... 183
Railway Maintenance Corp. ..... 123
Railway Track-work Co. ..... 191
Ramapo Ajax Division ..... 140
Reynolds Metals Co. ..... 178A
Rucker Company, The ..... 193
Rust-Oleum Corporation ..... 176

**S**

Schramm, Inc. ..... 173
Simmons-Boardman Publishing Corporation ..... 106
Skilsaw, Inc. ..... 187
Snow Construction Co., T. W. ..... 112
Sperry Products, Inc. ..... 119
Sperry Rail Service ..... 119
Stonhard Company ..... 184
Syntron Co. ..... 186

**T**

Templeton, Kenly & Co. ..... 193
Texas Company, The ..... 100
Timken Roller Bearing Company, The ..... 122

**U**

Union Carbide and Carbon Corporation ..... 127
Union Metal Manufacturing Company, The ..... 179
United States Treasury Dept. ..... 178B

**V**

Viking Pump Company ..... 193

**W**

Warwood Tool Company ..... 191
Weir Kilby Corporation ..... 175
Williams & Co., J. H. ..... 117
Wisconsin Motor Corporation ..... 189
Woodings Forge & Tool Co. ..... 171
Woolery Machine Company ..... 104
Worthington Pump and Machinery Corporation ..... 196

WHEN WINTER COMES
THOUGH HIDDEN FROM VIEW BY SNOW AND ICE, THE IMPROVED FAIR ANCHOR SECURELY GRIPS THE RAIL, ASSURING DEPENDABLE AND EFFECTIVE PROTECTION UNDER SEVERE CONDITIONS.
THE IMPROVED FAIR
RN PACIFIC RY. NEAR CRESCENT LAKE, OREGON

# TEAMWORK THAT CUTS MAINTENANCE COSTS

One of the Blue Brute Track Teams at work in the Boston & Albany Railroad yards at Springfield, Mass.

Count on this perfectly matched Blue Brute Track Team to do a lot of fast, efficient tamping, on very little air! The Hand-i-Air Compressor is as tough as they make 'em yet easily handled by two men. Through its easy-breathing Feather* Valves, this tireless, two-wheeled tornado delivers a steady supply of 60 cu. ft. per min. — ample for its four Blue Brute teammates.

They're the WTT-7 Tie Tampers. Men do *more* work with these light, precision-balanced 42-pounders — and do it *easier* and *faster* — while advantages like the leak-proof throttle and anti-freeze design mean tops in efficiency and economy under all conditions.

Adding up, here's teamwork that will surface more lineal feet of roadbed per day — every day. Such performance, remember, is typical of all Blue Brutes — the grouters, contractors' pumps, portable concrete mixers, air tools, etc. — that are cutting maintenance and construction costs all along the line. Checking on them — thoroughly — will be a smart move towards saving money in your own operations.

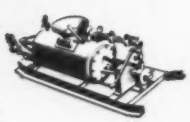
*Reg. U. S. Pat. Off.

H8-4

**WORTHINGTON**

Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division, Holyoke, Massachusetts
*Distributors in All Principal Cities*

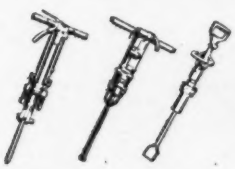
# BUY BLUE BRUTES



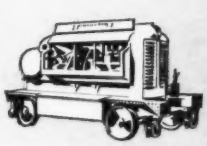
Pneumatic Grouter

Portable Concrete Mixer

Self Priming Centrifugal Pump



Hand Held Air Tools



Railcar Compressor

**FOR EVERY CONSTRUCTION AND MAINTENANCE JOB**